The development of two-week menu cycles for households with children allergic to wheat, soy, cow's milk and egg respectively.

by

Suzette Matthee

Thesis presented in partial fulfilment of the requirements for the degree of Master's of Science in Consumer Science (Foods) at the University of Stellenbosch.

December 2002

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and has not previously in its entirety or in part been submitted at any university for a degree.

Signature:

Date:

ABSTRACT OF THESIS

TITLE: The development of two-week menu cycles for households with children allergic to wheat, soy, cow's milk and egg respectively.

CANDIDATE: Suzette Matthee

STUDY LEADER: Dr. MC Vosloo

DEGREE: Master's in Consumer Science (Food)

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Food allergies in children are a growing problem and have various effects on these children, their households, the community and the economy. No medication or cure is currently available to consumers suffering from food-allergies. Medical teams are aware of the patients' need for support, but information is lacking and understanding of their basic needs and problems neglected.

Two qualitative research methods, namely the focus group technique and case studies were used to investigate the emotional and physical environment of children allergic to wheat, soy, cow's milk and egg respectively. Five focus group meetings were conducted with the caregivers of food-allergic children. Two during the pilot study and three in the main study. A total of twenty three participants attended the three meetings of the main study. A meeting schedule was developed and the meetings carefully moderated. After the data had been obtained from the focus group meetings, there was a need for more in-depth information and understanding.

Seven of the participants of the focus groups were identified, through developed criteria, to be further investigated as case studies. Five units of investigation were identified for the case studies. It was the (i) caregiver, (ii) allergic child, (iii) other children, (iv) "non-caregiver parent" and (v) household.

Some of the matters that were investigated in both the focus groups and case studies were health consciousness, menu planning, recipe needs and use, reading of food labels, hidden allergens and the social and emotional effects of having and being a food-allergic child. A great need for better support and educational programs to assist these households were identified. Very few of the households were health conscious, while they all experienced problems with menu planning, identifying hidden allergens and suffered from social and or emotional problems. Very few participants made use of recipes or identified a need for allergen-free recipes.

After having gained insight in the daily lives of these households, four - virtually identical, two-week menu cycles were developed to suit the life style requirements and restrictions of these children. The same recipes were used, but allergens omitted, replacements made and the recipes adapted as necessary. Product scouting was done for hidden allergens in selected popular convenience foods, especially those from the lowest level of the USDA Food Guide Pyramid. Hidden allergens appeared to be a problem when food is

prepared and bought for the food allergic child. It should be taken into account that despite the information stated on the food label undeclared allergens might still be present in food.

The two-week menu cycle for the child allergic to cow's milk was then quantitatively evaluated for nutritional adequacy by *FoodFinder* ^{TM} *2* – a software program, for children aged between seven and ten years. All the macronutrients and micronutrients identified by the National Survey in 1999 as insufficient (<67% of the RDA) among South African children aged between one and nine years, were evaluated as well as those mentioned in the WHO Dietary and Health Goals. All the nutrients were sufficient, except for calcium and Vitamin D. Supplementation is advised. The sensory acceptability of the menu-items in the two-week menu cycles were not evaluated.

A vast number of issues pertaining to the food-allergic child require further research. A great need exists for the development of educational programs to support the households with food-allergic children. The identification of hidden allergens and the development of reliable sensory testing models for food-allergic children are all areas that should urgently be researched further.

OPSOMMING VAN TESIS

TITEL: Die ontwikkeling van twee-weeksiklusspyskaarte vir huishoudings met kinders allergies vir onderskeidelik grane, soja, melk en eiers.

KANDIDAAT: Suzette Matthee

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Voedsel-allergieë by kinders is 'n groeiende probleem met 'n verskeidenheid effekte op dié kinders, hulle huishoudings, die gemeenskap en die ekonomie. Tans is geen medikasie of kuur teen voedsel-allergieë beskikbaar nie. Mediese spanne is bewus van die behoefte aan sorg en leiding wat deur dié spesifieke groep verbruikers benodig word, maar inligting oor hulle behoeftes en probleme is ontoereikend.

Twee kwalitatiewe navorsingsmetodes, naamlik die fokusgroeptegniek en gevallestudies, is gebruik om die emosionele en fisiese omgewing van kinders allergies vir onderskeidelik grane, soja, melk en eiers te ondersoek. Tydens 'n voorloperstudie is twee fokusgroepvergaderings gehou. Vir die hoofstudie is drie fokusgroepvergaderings met versorgers van kinders met 'n voedsel-allergie gehou met 'n totaal van drie en twintig deelnemers. 'n Vergaderingskedule is ontwikkel en die vergaderings is sorgvuldig gemodereer. Nadat die data van die fokusgroepe ingesamel is, was daar behoefte aan meer in diepte inligting en begrip.

Aan die hand van ontwikkelde kriteria is sewe van die deelnemers aan die fokus groepe as gevallestudies geselekteer. Vyf eenhede van ondersoek is geïdentifiseer vir die gevallestudies. Dit is: (i) die allergiese kind, (ii) versorger, (iii) ander kinders, (iv) die "nie-versorgende" ouer en (v) die huishouding.

Sommige van die aspekte wat in beide die fokusgroepe en gevallestudies ondersoek is, was gesondheidsbewustheid, spyskaartbeplanning, die gebruik en behoefte aan resepte, lees van voedseletikette, verskuilde allergene en die sosiale en emosionele effek van 'n voedsel-allergie op die kind sowel as die ouers. 'n Groot behoefte aan beter ondersteuning en opvoedkundige programme, om hierdie huishoudings te help, is geïdentifiseer. Baie min van die huishoudings was werkilk gesondheidsbewus, terwyl hulle almal probleme met spyskaartbeplanning, identifisering van verborge allergene en sosio-emosionele probleme ondervind het. Weinig van die deelnemers het gebruik gemaak van resepte of het 'n behoefte aan allergeen-vrye resepte ondervind.

Nadat insig in die daaglikse lewenstyl van hierdie huishouding verkry is, is vier amper-identiese twee-weekse siklusspyskaarte ontwikkel wat die lewenstyl en behoeftes van hierdie huishoudings aanspreek. Dieselfde resepte was gebruik vir al vier twee-weeksiklusspyskaarte, met die verskil dat verskillende allergene vervang

is, na gelang van die allergie verskillende behoefte. Marknavorsing is gedoen op alledaagse produkte en is hoofsaaklik gefokus op die produkte wat die basis van die voedselpiramide uitmaak. Daar is bevind dat verskeulde allergene voorkom in produkte waar dit nie verwag word nie, en soms selfs nie op die voedseletikette verklaar word nie.

Die twee-weeksiklusspyskaart van die melk-allergiese kind is kwantitatief ge-evalueer vir toereikendheid van die dieet vir kinders tussen die ouderdomme sewe tot tien jaar op die *Foodfinder* ^{TM} *2* – sagteware program. Die makro- en mikronutriente wat volgens 'n nasionale opname in 1999 as problematiese (<67% van die RDA) vir kinders in die ouderdomsgroep een tot nege, uitgewys is, is geneem en die voedingstowwe is ook teen die Werêld Gesondheidsorganisasie (WHO) se dieetdoelwitte getoets. Al die nutriënte was voldoende volgens die analise, behalwe kalsium en Vitamen D. Supplementasie word aanbeveel vir dié twee nutriënte. Die sensoriese aanvaarbaarheid van die spyskaartitems in die siklusspyskaart is nie getoets nie.

Verskeie aspekte wat vorendag gekom het, benodig verdere navorsing. 'n Groot behoefte aan die ontwikkeling van opvoedkundige programme, wat die huishoudings met voedsel-allergiese kinders ondersteun, bestaan. Die identifikasie van verskuilde allergene en die ontwikkeling van 'n beproefte sensoriese toetsmodel vir voedsel-allergiese kinders is potensiële gebiede wat dringend verder nagevors behoort te word.

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CHAPTER 1: INTRODUCTORY PERSPECTIVES

1.1 RATIONALE FOR STUDY

The professional consumer scientist uses scientific knowledge, skills, attitudes and values in order to address the consumer, products and services, as well as the knowledge of the interaction of the consumer with the environment aimed at contributing to satisfying the needs of the consumer towards the improvement of quality of life (Department of Consumer Science, 2001; Heiselman, 1994:1). A personal obligation as consumer scientist requires aiding allergic consumers and exploring the issues relevant to the allergic consumer, for example the relationship between foods ingested and adverse food reactions.

The term food allergy is often over-used by the public, some physicians and scientists to describe any undesired or bothersome problem related to ingestion of food(s). It is important to set definitions to describe the type of reactions. *Food intolerance* is used to describe non-toxic, nonimmune-mediated reactions and *food allergy* relates to immunological reactions (usually immunoglobulin E mediated) (Anderson, 1996:S19). It is also very important to know the definition of an *adverse reaction to food* due to the fact that a food allergy is a form of adverse reaction (Anderson, 1996:S20). An adverse food reaction refers to any abnormal reaction to food or an additive, whether caused by allergic or non-allergic mechanisms (Steinman, 2002).

Although the most accurate estimates suggest that less than 2% of the general population suffer from food allergies, the prevalence of adverse reactions to food is unknown (Anderson, 1996:S19). Studies of the prevalence of food allergy have shown that the clinical manifestations of food reactions are most commonly observed in the first three years of life. In prospective studies, in 80 - 87% of situations, a child, may "outgrow" allergy to certain foods e.g. cow's milk by the age of three. Clinical tolerance develops to soy, cereal grains, cow's milk and egg allergy (Anderson, 1996:S20), but not with peanut allergy and fish (Bush & Hefle, 1996:S132).

There is a growing interest in the problem of food allergy. There are indications that an increasing number of sensitised individuals suffer from the clinical features upon renewed contact with the offending food. It is also anticipated that, as a result of the rapid developments in biotechnology, which generally results in the introduction of new proteins and new biological varieties for consumption, the potential allergenicity will pose a major problem in their safety assessment (Knippels, van der Kleij, Koppelman, Houben & Penninks, 2000:251). Furthermore, allergic diseases are now considered a leading cause of illness and death (due to anaphylaxis), particularly in young children (Chandra, 2002:2). It is suspected that the frequency of food allergies can be directly linked to the dietary habits of society (Thompson & Chandra, 2002:4).

Virtually all food allergens are proteins, although only a small percentage of the many proteins in foods are allergens. Any food that contains protein has the potential to cause allergic reactions. However, a few foods or food groups are better known to cause allergies on a more frequent basis than other foods (Hefle, Nordlee & Taylor, 1996:S69). There is still much to be learned about food allergy. The frequencies, severity and variety of symptoms caused by foods are very controversial (Taylor & Lehrer, 1996:S91).

The treatment of allergic diseases has amongst others considerable economic consequences, and it is very difficult or even impossible to calculate in financial terms. These consequences include absence from school, social isolation, emotional distress, limited participation in sports, and other (Chandra, 2001:2).

Currently, there is no cure for food allergies. Strict avoidance is the only way to prevent a reaction (http://www.foodallergy.org/questions.html; Clark, McQueen, Samild & Swain, 1996:91). It is of the utmost importance that the allergic consumer should be able to eat differently without feeling different (Willingham, 2000:21). The problem is that very few interesting recipes are available, and that food allergies may thus lead to a lack of variety in their diet (Kruger, 2001:16). Allergic children find it especially difficult to eat appropriately within the boundaries set to them by their food allergy at friends' houses or at parties and still enjoy the experience.

Furthermore, it is important that the diet is healthy and therefore, a menu cycle with a collection of recipes for different kinds of allergies should be developed to make eating not only an enjoyable, but also a varied experience for people with a food allergy. A set of criteria should also be developed, so that the allergic consumer can firstly know it is allergen-free, and rest assured that two-week menu cycles are balanced.

Dr. Harris Steinman, the author of the software package "*Allergy Advisor*" which was developed to aid the medical profession and allergic consumer, identified a need for allergen-free recipes during the expansion of the computer program. The Department of Consumer Science became involved in this scientific program based on the needs of the allergic consumers.

The aim of this research was therefore to develop two-week menu cycles that address the needs of children allergic to wheat, soy, cow's milk and egg.

1.2 OBJECTIVES

The main objective of the descriptive research is to develop two-week menu cycles that fulfils in the requirements of children allergic to wheat, soy, cow's milk and egg based on these children's household and personal needs, as well as fulfilling in their nutritional needs and taking into account the culinary properties of the allergens, then evaluating one of the menu cycles for nutritional adequacy.

In order to this, the following subgoals were defined: (i) Determining the recipe needs of food-allergic children (focus groups and case studies) in order to address their felt needs, (ii) Determining the daily routine of food-allergic children and their household and their problems and needs (focus groups and case studies) to be able to develop two-week menu cycles that fulfil in these daily needs; (iii) Developing two-week menu cycles for the households with children allergic to wheat, soy, cow's milk and egg respectively that fulfils in their daily needs, (iv) Evaluating a developed two-week menu cycle for nutritional adequacy.

1.3 DESCRIPTION OF TERMS

The following terms were identified as relevant for this study: (i) **Adverse food reaction** A general term that is used to describe any abnormal reaction to a food or a food additive, whether caused by allergic or non-allergic mechanisms (Steinman, 2002); unusual response to food (Whitney & Rolfes, 1996:596); (ii) **Allergen** The antigenic molecules which provoke the allergic reactions (Bruijnzeel-Koomen *et al.*, 1995:625); (iii) **Anaphylaxis** a potentially life-threatening reaction characterised by the presence of either respiratory

difficulty and/or hypotension which can present as syncope, shock, or loss of consciousness and may be due to vascular collapse or independent means (Thompson & Chandra, 2002:3); (iv) **Antigen** Any substance which is capable, under appropriate conditions, of inducing a specific immune response and of reacting with products of that response, that is, with specific antibody or specifically sensitised T-lymphocytes, or both (Dorland's Illustrated Medical Dictionary, 1994:95); (v) **Atopic** Atopy is an inherited disposition to allergy and allergic disorders sometimes termed an allergic diathesis or hereditary allergy (Walton, Barondess & Locks, 1994:72); (vi) **Cross-reactivity** The interaction of an antibody with antigen that did not specifically stimulate its synthesis; it may be weaker than the reaction of an antibody with its homologous antigen; the interaction of an antigen with an antibody formed against a different antigen with which the first antigen shares identical or closely related antigenic determinants (Dorland's Illustrated Medical Dictionary, 1994:1426); (vii) **Food allergy or food hypersensitivity** An abnormal immunological reaction in which case the body's immune system overreacts to ordinarily harmless things (Steinman, 1998a) or the immune-mediated state of hypersensitivity that results from exposure to an allergen (Clydesdale, 1996:S187); or an adverse reaction to foods that involve an immune response (Whitney & Rolfes, 1996:596); (viii) **Food intolerance** An abnormal physical response to a food component that is non-immunologic, e.g. lactose intolerance. In this case the consumer lacks the enzymes (lactase) to break down the lactose for proper digestion (Steinman, 1998a; Dr. Horn, Charles, Personal communication, Microbiologist) or a non-immunological adverse reaction to foods due to dietary or other factors (Clydesdale, 1996:G2); (ix) **Food aversion** Psychologically based food reactions with a conditioned response elicited by recognition of the appearance, smell or taste of a particular food. Aversion reactions do not occur reproducibly if the food is presented in a disguised form. However, many patients with food allergy developed aversion as a secondary psychological problem or because the food has a bad taste (Bousquet, Metcalf & Warner, 1997:10); (x) **Food-induced symptoms** Symptoms caused by an adverse reaction to a foodstuff, whatever mechanism is involved (immunological or non-immunological) (Bousquet *et al*,.1997:10); (xi) **IgE-mediated** Results from stimulation of the body's immune system to produce IgE antibodies to that food or substances (Steinman, 1998a); (xii) **Menu cycle** is a carefully planned series of menus that offer different items from day to day for a specific period of time, after which the menus are repeated (Spears, 1995:148; Swanepoel, Loubser & Visser, 1992:31), (xiii) **Non IgE-mediated** Results from stimulation of the body's immune system to produce other antibodies (other than IgE), or a cellular response, to that food or substance (Steinman, 1998a).

1.4 LIMITATIONS

The limitations of this study are the following: (i) **Limited participation of allergic children** Only twenty-three food-allergic consumers took part in the focus group meetings, and seven of those participants were used for the case studies; (ii) **Selection of allergic children** Only children allergic to wheat, soy, cow's milk and egg were used in the study; (iii) **Ingredients** Only ingredients available in the Western Cape will be used in the development of the recipes; (iv) **Cross-reactions** between food were not considered in the development of recipes for the two-week menu cycles, (v) **Socio-economic classes** Only consumer that are from middle income groups were studied; (vi) **Ethnic culture** The extent to which the religious demands of the allergic consumers will be included in the study will depend on the response in the sample. If Moslems and Jews, who have particular dietary requirements, make up less than 5% of the sample, the study will be

limited to general dietary requirements, as was the case; (vii) **Nutritional adequacy** was only evaluated for the two-week menu cycle for children allergic to cow's milk.

1.5 OUTLINE OF STUDY

Chapter 1 deals with the rationale for study, objectives, limitations and outline. Chapter 2 contains all the relevant literature of the study, while Chapter 3 deals with the research in which the focus group technique was implemented and Chapter 4 reports on the case studies. Chapter 5 discusses the development of four two-week menu cycles for households with children allergic to wheat, soy, cow's milk and egg respectively, while Chapter 6 reports on the evaluation of the two-week menu cycle for nutritional adequacy for the cow's milk-allergic children and their households. Chapter 7 makes final comments and conclusions on this research and recommendations for further research.

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CHAPTER 2: LITERATURE REVIEW

2.1 AIM

The aim of the literature review is to explore information available on relevant issues of the study. The literature must give perspectives on and direction to the study.

2.2 ALLERGIC REACTIONS TO FOOD

The word "allergy" is from the Greek *allos* (other) and *ergon* (work), implying an inappropriate reaction to a stimulus (Dong, 1984:3). Over activity of various components of the immune system leads to the development of allergic or auto-immune diseases. A proper medical evaluation and diagnosis on a food allergy or intolerance is of the utmost importance. Unnecessary elimination of food items may result in nutrient deficiencies in the body (Lategan, 1997:2).

An allergy is either an adverse food reaction involving immunological mechanisms or it can be cellular. See Table 2.1 for the classification of food adverse reactions. Food allergies are either started by the production of specific antibodies (known as immunoglobulin (IgE), in reaction to food proteins, or it can be cell mediated. The body produces antibodies as defence against unknown substances such as viruses and bacteria. In certain consumers the immune system is triggered to extract a specific antibody (called immunologlobulin E (IgE)), against various substances like pollens, pet dander, insect venom or foods. The common immunological mechanisms involved can cause food-allergic reactions similar to allergic reactions as a result of exposure to bee stings or penicillin (Hefle & Taylor, 1999:63).

In food-allergic consumers IgE is produced against food proteins and chemical additives (e.g. iodine) and is circulated in the blood. When mast cells or basophils are reached, the IgE is fixed to the cell surface. A large quantity of the IgE in the body is fixed to these cells. When the cells are armed with IgE, they are sensitised. Mast cells are present in many tissues of the body and basophils are present in the blood. When allergens are ingested, they are partially digested and intact fragments are accidentally let through into the circulatory system. This is a defective mechanism (Dr Steinman, Personal communication 2001). In blood and tissue they are respectively exposed to the IgE bound to the mast cell or basophil surface. This contact causes a chain of events to occur in the cells, leading to the release of cellular chemicals, such as histamine. These chemicals are responsible for the symptoms of allergic reactions (Hefle & Taylor, 1999:63).

The symptoms manifested when the allergens are transported across the intestinal barrier, causing local allergic reactions, or to systemic circulation, giving rise to systemic responses. The clinical manifestations of food allergies are summarised in Table 2.2. Penetration of the gut depends on the size and structure of the food allergen, changes to the allergen due to digestion, gut permeability and interaction with other antibodies in the gut. Other factors to be considered are consumer responses to various amounts of allergen, sufficient IgE binding at the mast cell or basophil and the receptiveness of the affected organs to the mediators that are released. Other types of abnormal immunological responses to foods may also occur (Hefle & Taylor, 1999:63; Anderson, 1996:S19). Allergic reactions to multiple foods are common (Dr. Steinman, Personal communication. 2001).

Genetic factors play an important role in propensity to allergy. If both parents are affected and experience the same symptoms their children have a 78% risk to have it too. If the symptoms differ the children have a 58% risk of getting a food allergy, while if only one of the parents is food-allergic, the risk is about 35% (Champers, 2002:2).

2.2.1 Classification of the adverse food reactions

Various authors have attempted to classify adverse food reactions. Table 2.1 is a summary of all the different classifications (Bruijnzeel-Koomen *et al.*, 1995:632; Anderson, 1996:S20).

TABLE 2.1: CLASSIFICATION OF THE ADVERSE FOOD REACTIONS

Toxic Reactions	Non-toxic Reactions	
	Immune-mediated	**Non-immune mediated**
These occur in any exposed individual, if the dose is high enough. Toxic compounds may be naturally occurring or are included during food processing or are incorporated by accident. Symptoms of some toxic reactions may resemble those caused by allergy.	The term food allergy is served for immune-mediated reactions. Allergens are defined as the antigenic molecules giving rise to the immune response. **a. IgE-mediated** Symptoms include anaphylaxis and symptoms of the skin, and/or of the respiratory and gastrointestinal tracts. Various symptoms are documented. **b. Non-IgE-mediated** Reactions/symptoms include protein-induced gastro-enteropathy and celiac disease. The precise role of food in immune mechanisms involved in such disorders is not known. Other immunoglobulins, like IgG, are involved.	The term food intolerance is recommended for non-immune mediated reactions. **a. Enzymatic** Secondary lactose deficiency affects a large percentage of the world population, whereas most other enzyme deficiencies are rare inborn errors in metabolism. **b. Pharmacological** This form of intolerance is present in individuals who are abnormally reactive to substances such as vasoactive amines normally present in some foods. **c. Undefined** This includes adverse reactions to foods for which the offending mechanisms are unknown, including additive intolerances.

2.2.2 Clinical manifestations of food allergies

A consumer, who produces antibodies without having any symptoms, has an atopic sensitisation, while a consumer who produces antibodies and has symptoms has a symptomatic allergy (Whitney & Rolfes, 1996:596). Clinical manifestations of food allergy have been described (Anderson, 1996:S21; Beyer, 2000:649, 666; Clydesdale, 1996:G1-6; Dorland's Illustrated Medical Dictionary,1994; Steinman, 2001: 4; Steinman, 2002; Wilson, 2000:912) and are summarised in the following categories (seeTable 2.2).

Consumers with IgE-mediated allergic reactions to foods will experience symptoms on exposure to small amounts of the offending food. The precise tolerance for allergenic foods has not been investigated carefully (Taylor, Hefle & Muñoz-Furlong, 1999:20).

TABLE 2.2: THE CLINICAL MANIFESTATIONS OF FOOD ALLERGY

Type of clinical manifestations	Description
1 Anaphylaxis	An acute, often severe and sometimes fatal immune response that may affect one or more organ systems
2 Food-dependent, exercise-induced anaphylaxis (F-EIA)	A form of anaphylaxis in which urticaria or shock develops after the combination of both eating a meal and performing vigorous exercise within 2 hours of eating
3 Oral allergy syndrome (OAS)	Localised symptoms of itching and swelling of the mouth parts during and after eating
4 Gastrointestinal tract reactions	
4.1 IgE-mediated reactions	Results from stimulation of the body's immune system to produce IgE antibodies to that food or substances and which affect the organs of the gastrointestinal tract.
4.2 Food protein-induced enterocolitic syndromes	Inflammation involving both the small intestines and the colon
4.3 Celiac disease (gluten-sensitivity enteropathy)	Gluten-sensitive enteropathy, dermatitis
5 Respiratory reactions	
5.1 Rhinitis	Inflammation of the mucous membrane of the nose
5.2 Asthma	Reversible airway obstruction demonstrated by wheezing and shortness of breath
5.3 Sinusitis	Inflammation of a sinus.

TABLE 2.2: THE CLINICAL MANIFESTATIONS OF FOOD ALLERGY (continue)

6 Skin disorders 6.1 Eczema/ Atopic dermatitis	A chronic skin disorder that occurs primarily in children characterised by an eczematous rash with inflammation resulting from exposure to both food allergens and nonallergic factors
6.2 Angioedema	A skin eruption similar to hives, but affects larger areas and extends deeper into the tissue
6.3 Urticaria	An acute or chronic skin disorder in humans characterised by itching and hives
7 Conjunctivitis	Inflammation of the conjunctivita, generally consisting of conjunctival bloody discharge.
8 Occupationally acquired food allergy	Recurrent exposure to particular proteins resulting from occupational responsibilities, which may sensitise consumers, e.g. cereal grain allergy of millers. Any of the above symptoms may result.

As already mentioned the symptoms arising from a food allergy are immune-mediated, while those arising from a food intolerance are the product of non-immune mechanisms. At least 30% of all people living in a westernised society would experience one or more episodes of food intolerance. Food intolerance is similar to food allergy in that both frequently produce common symptoms (Thompson & Chandra. 2002:3).

2.2.3 Hidden allergens

Usually hidden allergens are looked for on food labels (Joshi, Mofidi & Sicherer, 2002:1019), but this is a limited understanding of the mechanism. The unwitting exposure to hidden allergens occur through not only ingestion, but also inhalation, breast feeding and skin contact" (Steinman, 2002B). Hidden allergens can be ingested in a variety of processed foods. Research by Hirose, Ito, Hirata, Kido, Kitabatake and Narita (2001:1438-1440) also give evidence of hidden allergens in breast-milk. The research done by Roberts, Golder and Lack (2002:713-717) also gives further support to the fact that food allergies can be inhaled.

Baker and David (1997:46) observed that "reading labels is no easy task, because many food manufacturers use scientific words or chemical names which mean nothing to the lay person". Moneret-Vautrin, Kanny, Morisset, Flambee, Guenard, Beaudouin and Parisot (2001:1071) stated that consulting a food label is misleading and Altschul, Scherrer, Muñoz-Furlong and Sicherer (2001:468) considers even asking 'someone who would know' is a problem. They stated that "current labelling and manufacturing procedures present an enormous variety of challenges for food-allergic individuals and their families" (p469).

An emerging challenge to food safety and mandatory labelling of relevant food allergens is still being debated on. According to Besler (2001:662) there is currently only a few validated detection methods available for a limited number of food allergens.

2.2.4 Breast-feeding and the prevention of food allergies

Breast-feeding is the preferred mode of feeding all infants, including those with parental history of atopy. The benefits of breast-feeding for prevention of allergic disease were confirmed in several studies and are enhanced if the mother restricts her intake of common food antigens, such as milk and other dairy products, egg, fish, peanut and soy (Chandra, 2002:2).

The immunosuppressive properties of breast milk may facilitate tolerance induction to harmless food antigens and antigens associated with normal food bacteria (Brandtzaeg, 1998:S12), and may explain why breast-fed infants have a lower incidence of food-related allergies (Kelly & Coutts, 2000:181).

Breastmilk is the ideal nutrition for young infants and offers both short-term and long-term benefits. Human breast milk supports optimal growth, enhances immune functions, is hypoallergenic and its overall composition aids in establishing a healthy gut flora. For these reasons, the evidence of infections, allergy, enterocolitis, obesity, lymphoma and diabetes is lower in breast-fed than formula-fed babies (Chandra, 2002:3).

Researchers have found that dietary intervention such as the avoidance of high-allergenic foods during pregnancy and lactation, prolonged exclusive breast-feeding, the use of a hydrolysed milk formula and delayed introduction of dairy products, egg, fish, nuts and soy are all associated with a lower incidence of food allergy and other atopic conditions (Thompson & Chandra, 2002:2). Furthermore, the Western diet has been expanding to include more varied and foreign foods, resulting in the increased exposure of a larger proportion of the population of food allergens. Other factors, which have been implicated, are early introduction of solid foods; changes in the occurrence of infectious disease and living in highly insulated homes (Thompson & Chandra, 2002:4).

Economic analysis showed that breast-feeding is the most cost-effective approach to the prevention of allergic diseases in children.

2.3 COMMON ALLERGIES

Any food that contains protein has the potential to cause allergic reactions in some consumers. Some foods are just more common in provoking allergic reactions than others that are very similar in composition (Hefle, *et al.*, 1996:S69; Taylor & Lehrer, 1996:S91). At a 1995 consultation on food allergies, a group of international experts confirmed that peanuts, soy, *crustaceae* and fish, cow's milk, eggs, tree nuts and grains are the most allergenic foods. These foods are responsible for over 90% of serious allergic reactions to foods (Hefle, *et al.*, 1996:S69).

Food is a complex mixture containing a variety of allergenic and non-allergenic components. Identifying, purifying and characterising the allergens in food can be a major challenge. Most known food allergens are soluble in aqueous solvents. Some food allergens may be present in trace amounts, yet may be major allergens because of the extreme sensitivity of some consumers to particular food allergens. This situation can easily lead to mistaken conclusions regarding the allergenicity of specific foods (Taylor & Lehrer, 1996:S92). All the hidden allergens must be specifically labelled on the product to prevent any problems.

The right terminology needs to be used as stipulated by law (South African Department of Health, 2002:74-75).

Studies of the prevalence of food allergy have shown that the clinical manifestations of food reactions are most commonly observed in the first three years of life. The more serious the initial clinical reaction to food, however, the longer it takes the child to develop tolerance. It has also been shown in older children and adults that if the offending food can be identified and totally eliminated from the diet for a given period of time, clinical tolerance to that food develops in some consumers (Anderson, 1996:S20-S21). The prevalence of allergic sensitivities to specific foods also varies from one country to another depending on the frequency with which the food is eaten in that country and the typical age it is introduced into the diet (Parker, Leznoff, Sussman, Tarlo & Krondl, 1990:324). As mentioned in the previous section breast-fed infants have a lower incidence of food allergies.

Of all the main allergies, namely wheat, soy, cow's milk, egg, peanut and fish allergy, only wheat, soy, milk and egg will be discussed as these allergens are the focus of the study.

2.3.1 Allergy to grains

No other food family plays as large a role in keeping the human race from starvation, as does the grass family (*Poaceae*). Its cereal grain members - wheat, corn, oats, rye and barley - are the staples of the human diet the world round (Frazier, 1975:99). However, they are also associated with food allergies.

It is important to differentiate between celiac disease and grain allergy. The two are not the same. Grain allergy refers specifically to adverse reactions involving immunoglobin E (IgE) antibodies to one or more protein fractions of grain, including albumin, globulin, gliadin and glutenin (gluten), while celiac disease is mediated by IgA and IgG antibodies. A grain allergy is mediated by IgE antibodies (Motala,1998b:1)

The majority of IgE-mediated reactions to grains involve the albumin and globulin fractions. Gliadin and glutenin may also induce IgE-mediated reactions, though rarely (Motala, 1998b:2), while reaction to these proteins is characteristic of celiac disease.

Wheat and its constituent grains, cause the following symptoms: (i) Food-dependent exercise induced anaphylaxis (Dr Steinman, HA. Personal communication. Food allergy specialist, 2001); (ii) Gastrointestinal reactions - IgE-mediated reactions, food protein-induced enterocolitic syndromes, gastroenteritis, celiac disease (Motala, 1998b:2); (iii) Oral allergy syndrome (OAS); (iv) Respiratory reactions - asthma or allergic rhinitis (Motala, 1998b:2); (v) Occupationally acquired food allergy - urticaria, eczema, angioedema (Motala, 1998b:2).

All forms of grain must be avoided. This includes wheat, barley, rye, spelt, triticale, kamut and possibly oats (whose rarely allergenic) - thus all cereal grains. They can be found in: (i) Nearly all baked goods, (ii) Thickening agents in soups, puddings and sauces, (iii) Some flavourings and colourings (although caramel colouring is gluten free), (iv) Dusting on candy, (v) As hidden allergens in additives such as mono- and diglycerides, hydrolysed vegetable or plant protein and dextrins, (vi) Processed goods like sausage (Willingham, 2000:42).

Wheat cross-allergenicity exists between rice, buckwheat antigens and latex, as well as with banana, avocado and tomato (Steinman, 2002).

In recipe and product development, it is important to know how to read product labels for the selection of appropriate ingredients, or to be able to identify the potential harmful ingredients or additives on the label or from the ingredient list of recipes being considered for use. The reason is to establish whether the food source contains an allergen or not. If this is not clear, the information should be obtained from the distributors/agents or manufacturers. The following list gives a selection of all the components on a food label that indicate, or may indicate, the presence of wheat proteins (South African Department of Health, 2002:75): all-purpose flour; bleaches and unbleached flour; bulgur (cracked wheat); bran; corn starch; couscous; durum wheat/flour; enriched flour; farina; gelatinised starch (or pre-gelatinised); gluten; graham flour; high protein flour; kamut; malt; miller's bran; modified starch; oats; semolina; spelt; starch; vegetable gum; vegetable starch and white flour.

A diet that are gluten-free and a diet that are wheat-free is not the same. Fortunately a variety of gluten-free baking flours are commercially available. The table is included for the sake of completeness, though it is of more use for the consumer suffering from celiac disease. It is recommended to replace cereal flours with a mixture of flours – not just one flour - to maximise the unique, important traits of each (Willingham, 2000:182; Griffiths, 1986:42-43).

Table 2.3 presents a summary of the gluten-free flours available and states their characteristics.

TABLE 2.3: GLUTEN-FREE FLOURS FOR BAKING (Modified from Willingham, 2000:178-180)

FLOUR	CHARACTERISTICS
Arrowroot	Good in baking because it adds no flavour of its own and lightens baked goods. Produces a golden brown crust when used for bread baking. Replaces corn starch or tapioca in baking.
Bean flour	Slightly yellow in colour, provides beneficial protein for baking and has a slight "beany" taste. May totally replace rice flour in baking.
Corn flour	Light yellow in colour. Combine with other flours, including corn meal, in baked goods.
Corn meal	White or yellow with a corn flavour. Excellent in corn bread, muffins and waffles - especially when blended with corn flour.
Corn starch	Snow-white, flavourless and powdery. Lightens baked goods. Use only in combination with other flours. Commonly used as thickener in sauces and gravies.
Potato flour	Heavy, light yellow flour made from whole potatoes. Use in very small quantities in baking; adds crispness and body to baked goods.
Potato starch	Very white, bland powder. Excellent baking properties when combined with other flours and eggs. Lumps easily; stir before measuring.
White and brown rice flour	White rice flour is white; brown rice is slightly tan. Bland flavour. Dry and gritty alone; better if combined with other flours.
Sorghum	Light tan colour, flavour similar to wheat - but can be bitter in large quantities. Somewhat dry, best if no more than 15% of flour mix is replaced by sorghum flour.
Soya	Light tan colour. Bland, somewhat "nutty" flavour - almost bean-like. Excellent in baked goods with nuts, fruits or chocolate.
Sweet rice	White in colour, bland flavour. Makes smooth, creamy sauces.
Tapioca	Snow-white, velvety powder. Lightens baked goods; adds "chewiness" to breads. Browns nicely; gives crispy bread.

2.3.2 Allergy to soy

Soy allergy occurs to the protein component of soy bean and involves the antibody immunoglobulin E (IgE) of the immune system (Steinman, 1998).

Soy is widely distributed in processed foods so that avoidance of soy in the diet is very difficult (Dong, 1984:50). Soy is a good source of protein and has texturising and emulsifying properties. It is thus used in a variety of food products to increase the protein level, to substitute meat protein or to influence the manufacturing process. Consequently, few bread products are free of soy flour and many sausages and other bread products such as meatballs may have added soy (Steinman, 1998). In fact few manufactured foods are free of soy (Speer, 1983:137). Soy beans and related products are used as flour, milk, nut or oil.

Unlike most vegetable allergens, soy allergens are heat stable. In other words, cooking and heat treatment will not destroy the allergenic potential of soy, although some proteins may be denatured (Steinman, 1998:1).

The following **foods** are likely to contain some form of soy protein (Steinman, 1998:2): baby foods; black pudding; bread; breakfast cereal (muesli, *Pronutro*); burger patties; butter substitutes; cakes; candy; canned meat; confectionery goods, fish in sauce; canned or packed soups; canned tuna; cheeses; Chinese food; chocolates (cream centers); cookies; cooking oils; crackers; desserts; gravy powders; hamburger patties; hot dogs; hydrolysed vegetable protein; ice cream; infant formula; liquid meal replacers; margarine; meat products; pies; powdered meal replacers; salad dressings; sauces; seasoned salt; shortenings; snack bars; soups; soy pasta products; soy sauce; soy sprouts; soy beans; soy bean salad; stews; stock cubes; tofu; tofutti and tv dinners.

The list below gives a selection of all the **ingredients on a food label** that indicate or may indicate the presence of soy in food (South African Department of Health, 2002:74; Steinman,1998:2; Dong,1984:51): bulking agent, emulsifier, hydrolysed vegetable protein (hvp), lecithin, miso, MSG, protein, protein extender, soy flour, soy nuts, soy panthenol, soy protein, soy protein isolate, soy sauce, soy bean, soy bean oil, stabiliser, starch, textured vegetable protein (TVP), thickener, tofu, vegetable broth, vegetable gum and vegetable starch.

A reaction to soy usually occurs within thirty minutes after contact with soy but delayed reactions can occur 12 - 24 hours later (Steinman, 1998:2). The most common symptoms are (Steinman, 1998): (i) Anaphylaxis; (ii) Gastrointestinal tract reaction - abdominal pain; (iii) Respiratory reactions – rhinitis; (iv) Skin reactions – angioedema; (v) Conjunctivitis.

2.3.3 Allergy to cow's milk

Cow's milk is one of the most common food allergies in children, perhaps because it is usually the first foreign protein (allergen) encountered by infants. Cow's milk allergy (CMA) affects about 2% - 7.5% of all infants (Groenewald, 1998:1). According to Speer (1983:121), cow's milk is the undeniable "king" of the food allergens. It is not only the most widespread in all age groups, but also causes an unusually large variety of symptoms. Since it ordinarily does not cause harsh symptoms, at least in children over one year of age, milk

allergy is easily over-looked (Speer, 1983:122). There is also a distinct contrast between milk allergy and milk intolerance. Only milk allergy will be discussed in this research.

Milk contains many protein fractions (allergens) that cause allergic reactions. The two main components are whey and casein and a consumer may be allergic to either or both (Groenewald 1998:2). There is cross-reactivity among milk proteins obtained from cows, goats and sheep. Only the whey fraction in the goat's milk differs from that in the cow's milk. Goat's milk is tolerated by only 40% of children who are allergic to cow's milk (Groenewald, 1998:2).

Casein is usually stable when exposed to heating. It is important to remember that milk undergoes structural changes during heating. Thus, evaporated and boiled milk is no answer to avoid an allergic reaction. Table 2.4 demonstrates the different cheeses to which consumers sensitive to whey and casein respectively are likely to react (Frazier, 1975:76).

TABLE 2.4: CONSUMERS SENSITIVE TO WHEY AND CASEIN ARE LIKELY TO REACT TO CHEESES MADE OF WHEY AND CASEIN RESPECTIVELY.

Whey sensitive	Casein sensitive
cottage cheese, cream cheese, ricotta, Gervais, Neufchatel.	Edam, Parmesan, Cheddar, American, Gruyere, Swiss, Romano.

The following symptoms could indicate a possible milk allergy (Groenewald, 1998:2; Frazier, 1975:74): (i) Gastrointestinal tract reactions - excessive colic, recurrent diarrhoea, vomiting, abdominal pain; (ii) Respiratory tract reactions- sinusitis, rhinitis; (iii) Occupationally acquired food allergy - urticaria and eczema.

The following list gives a selection of all the ingredients on a food label that indicate or may indicate the presence of milk in the food (South African Department of Health, 2002:74; Groenewald, 1998:2): artificial butter flavour, butter, butter fat, buttermilk solids, caramel colour, caramel flavour, casein, caseinate, cheese, cream curds, "de-lactosed" whey, dry lactose solids, high protein flour, lactalbumin, lactalbumin phosphate, lactoglobulin, lactose, margarine, milk derivative, milk solids, natural flavouring, rennet casein, sour cream, sour milk solids, whey, whey powder and whey protein concentrate.

Three out of four infants with CMA are likely to develop a hypersensitivity to other food proteins, including egg, peanuts, nuts, soy, wheat and fish. In addition, up to 20% of infants with CMA will not tolerate even extensively hydrolysed casein, hydrolysate and whey formulas (Hill, 1999:40). Most children will outgrow their CMA (Steinman, 2001:2) - about 60% - 80% at four years of age. Some patients retain the allergy throughout life. If the milk is strictly excluded from the diet for two to three years, the child has an 80% chance of developing a tolerance to small amounts of it again. CMA may be acquired later on in life (Groenewald, 1998:1).

There is a distinct difference between milk allergy and milk intolerance. Milk intolerance is more common in adults, and is also known as lactase deficiency. Lactase deficiency may produce gastrointestinal symptoms after intake of lactose-containing food because lactose is not degraded in the small intestines. The symptoms produced are abdominal bloating and pain, flatulence and loose stools. All people with lactase

deficiency, however, do not have symptoms from lactose-containing food. Only symptomatic individuals are called lactose intolerant (Pelto, Laitinen & Lilius, 1999:229).

2.3.4 Allergy to egg

Allergy to proteins from egg of the domestic chicken (hen) is one of the most frequently implicated causes of immediate food allergic reactions in children in developed countries or communities (Motala, 1998c:1). Eggs are a close second to milk in most commonly caused allergies in infants and very young children. Eggs have two main allergenic fractions whose properties differ dramatically. Egg yolk claims fewer victims than egg white (albumin) and when it does, its effects are less drastic (Frazier, 1975:88-89). Immediate food allergic reactions occur as a result of interaction between IgE antibodies and the protein component of egg (Motala, 1998c:1).

Allergic reactions to egg (IgE-antibody mediated) usually begin within minutes to 1-2 hours after eating egg. Certain consumers may react to inhaling "egg fumes" or to skin contact. The symptoms may involve the following (Motala, 1998c:3): (i) Gastrointestinal tract - abdominal cramps, nausea and vomiting; (ii) Respiratory tract - asthma, rhinitis, (iii) Skin - urticaria, eczema, angioedema.

The list below gives a selection of all the ingredients on a food label that indicate or may indicate the presence of egg in the food (South African Department of Health, 2002:74; Motala, 1998c:2): albumen, binder, coagulant, dried egg, egg, egg white, egg yolk, egg powder, egg solids, egg substitutes, emulsifier, globulin, livetin, lecithin, lysozyme, ovalbumen, ovomucin, ovomucoid, ovoglobulin, ovovitellin, vitellin.

2.4 PROPERTIES OF THE INGREDIENTS PERTAINING TO THE MENU ALLERGENS AND IMPLICATIONS FOR RECIPE DEVELOPMENT

When developing recipes it is important to know the nutritional value and additional health benefits of ingredients, as well as its culinary properties. In menu cycle development for food-allergic children it is important to take care that the recipes are well balanced and tasty and to accomplish this the health benefits and culinary functions of grains, soy, milk and egg in recipes must be known, so that choices can be made bearing these ingredients in mind. Table 2.5 gives a summary of the various components and their implications in recipe development.

TABEL 2.5: THE MACRONUTRIENTS, VITAMINS AND MINERALS IN 100g PORTIONS OF FOODS FROM GRAINS, SOY, MILK AND EGGS (Langenhoven, Kruger, Gouws & Faber, 1991:8-11).

	Substance	Moisture %	Energy kJ	Protein g	Fat g	Carbo-hydrate g	Fibre g	Choles-terol mg	Calcium mg	Phosphorus mg	Sodium mg	Potassium mg	Iron mg
Grains	Bread, rye	37.40	932.00	8.30	1.70	45.80	5.80	0.00	80.00	160.00	580.00	190.00	2.50
	Bread, whole whea	36.80	930.00	8.30	2.10	44.20	6.60	0.00	57.00	175.00	380.00	213.00	1.30
	Bread, white	35.40	1000.00	8.50	1.80	49.30	3.10	0.00	56.00	103.00	490.00	139.00	1.20
	Tastee wheat, cooked	87.10	223.00	1.50	0.20	11.00	0.00	0.00	20.00	17.00	1.00	17.00	0.00
	Oats, rolled and cooked	85.30	274.00	1.70	1.60	9.60	1.60	0.00	8.00	77.00	2.00	57.00	0.70
Soy	Soy beans, dried cooked.	62.60	725.00	16.60	9.00	4.80	5.10	0.00	102.00	245.00	1.00	515.00	5.10
	Soy flour	2.70	1365.00	46.50	6.70	24.00	14.00	0.00	188.00	593.00	18.00	2570.00	6.00
	Tofu, fried	50.50	1135.00	17.20	20.20	9.30	1.20	0.00	372.00	287.00	16.00	146.00	4.90
Milk	Skim Milk	90.80	146.00	3.40	0.20	4.90	0.00	2.00	123.00	101.00	52.00	166.00	0.00
	2% Milk	89.20	208.00	3.30	1.90	4.80	0.00	8.00	122.00	95.00	50.00	154.00	0.10
	Whole Milk	88.00	257.00	3.30	3.30	4.70	0.00	14.00	119.00	93.00	49.00	152.00	0.10
Egg	Egg white raw	86.80	221.00	11.30	0.10	1.10	0.00	0.02	4.00	27.00	131.00	79.00	0.10
	Egg yolk, raw	49.10	1471.00	16.30	29.60	3.60	0.00	1238.00	104.00	388.00	45.00	81.00	4.80

2.4.1 Wheat

Nutritional and health benefits Cereal grains provide the world population with a majority of its food. They contain approximately 75% carbohydrates, 10% protein, 1 - 2% fat, 10% moisture and 1 - 2% minerals (Charley & Weaver, 1998:164-165). See Table 2.5 for the nutrient composition of maize, oats and wheat.

Grains consist of an outer layer, or hull. It is coarse and inedible and covers the fibrous bran layer, which contains protein, niacin and iron. On the inside is the white starchy endosperm, which also contains a little protein, but less of the other nutrients. The innermost part is the germ, which is the source of growth for the new plant and which contains protein and fat and is rich in iron, other trace minerals and B vitamins.

The nutritive value of cereal products varies with the part of the grain that is used and the method of processing (Bennion, 1995:248). A whole-grain cereal is one that contains all of these parts apart from the outer hull. When a grain is fully milled, or refined, all parts are removed except the least nutritious endosperm portion (Bennion & Scheule, 2000:267). The carbohydrate content of grains is high. It varies in amount depending on the variety of grain used, as well as the grade to which it has been refined (Langenhoven, Kruger, Gouws & Faber, 1991:8-11). The high fibre content, especially of whole grains, in addition to other components especially starch, underlines the general suggestion that the diet be based on cereals (Charley & Weaver, 1998:166) and other starches. This recommendation is also substantiated by

South African research (Love, Maunder, Green, Ross, Smale-Lovely & Charlton, 2001:11): " Make starchy foods the basis of most meals".

Grains are a fair source of protein. However of a quality somewhat lower than that found in animal foods such as meat, milk and egg (Langenhoven, Kruger, Gouws & Faber, 1991:8-11). Cereals as a group are deficient in lysine, while it is low in tryphophan and methionine (Charley & Weaver, 1998:165).

The total fat content in grains are usually low. The saturated fatty acids in grains are also low and the largest portion of the total fat content of grains are the mono-unsaturated fatty acids (Langenhoven, Kruger, Gouws & Faber, 1991:8-11).

Grains are rich sources of Vitamin B (Langenhoven, Kruger, Gouws &Faber, 1991:8-11). Obviously in a diet where grains are to be excluded, careful attention should be given to appropriate nutritional alternatives which are also high in the nutrients that grains provide in the diet, namely carbohydrates, fibre and energy an Vitamin B.

Culinary properties Wheat used for flour are classified in terms of their "hardness" or "softness". Hard wheat varieties are higher in protein content than soft wheat and usually has greater baking strength with the result that these varieties produce a large volume and fine texture in, for example, a loaf of bread. Wheat flour is uniquely suitable for bread-making because it contains proteins that develop strong, elastic properties in dough (Charley & Weaver, 1998:401). Bread flours have the right combination of viscous and elastic properties to give good gas retention and this results in bread of good appearance, good volume and attractive texture and mouth-feel (Charley & Weaver, 1998:212). The high molecule weight fraction of gluten (glutenin and gliadin) is the fraction responsible for the visco-elastic properties of the dough (Charley & Weaver, 1998:401).

Starches are a big component of grains which are used in food for six reasons (Willan, 1995:319): Thickening agents (sauces, cream soups, pie fillings); colloidal stabilisers (salad dressings); moisture retention (cake toppings); gel-forming agents (gum confections); binders (wafers, ice cream cones) and coating and glazing agents (nut meats, candies).

In our culture, the main purpose of starch is artistic rather than nutritional: to make foods more pleasing to the eye, to impart better texture and "mouth-feel", to prevent parting of ingredients and to provide transporters for delicate flavours (Pomeranz, 1992: 47).

2.4.2 Soy

Nutritional and health benefits Soy is a good source of protein of high biological value (Smolin & Grosvenor, 2000:178; Charley & Weaver, 1998:423). It is a better source of the essential amino acids, e.g. isoleucine, leucine, phenylalanine, threonine and valine, and are higher in protein than other legumes. Adequately processed soy products provide protein of equivalent value to animal proteins (Charley & Weaver, 1998:438). Substitution of soy protein for animal protein was associated with significant decreases in total cholesterol, low-density lipoprotein cholesterol (LDL-C) and triglycerides while maintaining high–density lipoprotein cholesterol (HDL-C) concentrations (Potter, 2000:54; Erdman, Stillman & Boileau, 2000:679).

They are high in fat, unlike other legumes but relative low in cholesterol (Smolin & Grosvenor, 2000:178-179; Bennion, 1995:537). They are very rich in complex carbohydrate and fibre (Smolin & Grosvenor, 2000:178-179; Bennion, 1995:537).

Soy contains more calcium than other legumes and most cereals (Smolin & Grosvenor, 2000:178; Charley & Weaver, 1998:423). The phosphorus content of soy is high. It is a better source of iron, and equal or better source of thiamin than whole grain cereals. Soy compares well with lean meat as a source of iron and is a better source of thiamin. Most legumes contain little more riboflavin than rolled oats or whole wheat but less niacin than whole wheat. Soy also has very low sodium content (Smolin & Grosvenor, 2000:178; Charley & Weaver, 1998:423).

The health-promoting effects of soy are well documented. It has been suggested that soy might reduce the risk of heart disease, cancer and osteoporosis while also lessening the symptoms of menopause (Craig, 1997:S200; Schenker, 1999:111; Smolin & Grosvenor, 2000:179). The composition analysis of cooked soy products can also be seen in Table 2.5.

Obviously in a diet where soy is to be excluded, careful attention should be given to appropriate nutritional alternatives which are also high in the nutrients that soy provide in the diet, namely carbohydrates, fibre and energy, iron and thiamin.

Culinary properties Soy is incorporated into recipes in a variety of ways. The soy bean may be dried and ground into flour, cracked into quick-cooking granules or grits, or utilised as cooking oil after being processed (Willan, 1996, 322). People allergic to soy are not always allergic to soy oil (Hefle & Taylor, 1999:63). Soy is also used as a flavouring ingredient. Fermented soy beans and miso are flavouring ingredients, while soy sauce is a well-known condiment (Willan, 1996, 32-33; 322). Soy sauce gives a dark colour and a distinct taste to food (Willan, 1996, 32). Soy milk is a popular beverage, while soy beans can be cooked in the same way as white kidney beans and are available fresh or dried (Willan, 1996, 322).

Textured vegetable protein is compressed soy flour, often coloured to resemble a variety of meat products (Willan, 1996, 322). Soy flour made from finely ground raw soy beans gives a dark crust and a slightly sweet taste. Breads that contain soy flour, keep very well (Willan, 1996, 344).

2.4.3 Cow's milk

Nutritional and health benefits The average percentage composition of whole cow's milk is 88% water, 3.3% protein, 3.3% fat, 4.7% carbohydrate and 0.7% ash. The quantitative composition varies slightly due to the large amount of variables present (Table 2.5). The most variable component of milk is the fat, followed by protein (Bennion, 1995:422), although the variable is slight between 0,5 to 3-4% (Langenhoven, Kruger, Gouws & Faber, 1991:8-11). Lactose provides 30% of the energy in cow's milk and lipids provide 50% of the energy (Trahms, 2000:203).

About 28% of the protein in milk is casein. Most of the remaining protein is classified as whey protein made up principally of lactalbumen and lactoglobulin (Bennion, 1995:422).

The carbohydrate of milk is lactose, which is a disaccharide. On hydrolysis, it yields the monosaccharides glucose and galactose. Lactose is the least sweet and the least soluble of the common sugars (Bennion, 1995:424). In the case of milk intolerance it is usually due to intolerance to lactose.

The fat in milk is a very complex lipid. It exists in whole milk as tiny droplets distributed in the milk serum. Thus, milk is an emulsion. Monounsaturated oleic acid is the main fatty acid in milk. Linoleic acid, an essential fatty acid, provides 1% of the energy, also the cholesterol content in cow's milk is 2 - 16mg/100g (Trahms, 2000:203, Langenhoven, Kruger, Gouws & Faber, 1991:8-10). The lipid portion includes both phospholipids and triglycerides (Bennion, 1995:423).

Milk contains some thiamin. It is a good source of niacin and an excellent source of riboflavin (Charley & Weaver, 1998:308). Milk supplies a substantial amount of calcium to the diet. If milk is omitted it is very difficult to obtain the right amount of calcium for the diet (Bennion & Scheule, 2000:448). Fat-soluble vitamins A, D, E and K are carried in the fat globules. Some yellow fat-soluble carotenoid pigments are also found with the fat (Bennion, 1995:424), which are converted to Vitamin A by the body. When fat is removed from milk, the fat-soluble vitamins A, D, E and K are also removed (Bennion & Scheule, 2000:446).

Phosphorus aids calcium in building strong bones and teeth. Usually milk is pasteurised and homogenised. Homogenisation has no effect on nutritional value. It is simply a mechanical process, using centrifugal force that breaks up the fat globules so they will not part and rise to the top as cream. Pasteurisation is a short heat treatment (72-75ºC for 15 seconds) used to destroy bacteria such as *Salmonella*, that could cause disease. Pasteurisation does not adversely affect the nutrients in milk, although it does reduce some of the proteins as well as the thiamin and vitamin C levels. Since milk is not considered a useful source of these vitamins, this change is not considered nutritionally important (Bennion & Scheule, 2000:449).

The composition of milk differs depending on the type of milk selected. It is important to consider it when selecting milk. Table 2.5 shows the difference between skim, 2% and whole milk. The following types of milk products are available: non-fat milk, low-fat milk, non-fat dry milk, evaporated milk, sterilised milk and fermented milk (Bennion & Scheule, 2000:452-457).

When soft drinks are regularly consumed the intake of milk has to be monitored carefully. Consumption of soft drinks instead of milk reduces calcium intake and increases phosphorus intake since soft drinks are high in phosphates and phosphates may interfere with calcium utilisation (Wenck, Baren & Dewan, 1983:271). Obviously, in a diet where milk is to be excluded, careful attention should be given to appropriate nutritional alternatives which are also high in the nutrients that milk provide in the diet, namely calcium, phosphorus and Vitamin D.

Culinary properties Dairy foods are fundamental to the Western cuisine. Milk is the basis of most soups and sauces (Willan, 1996, 68). Cream is less important as a result of a shift to low-fat diets (Sloan, 1999:49) and cultured dairy foods like yoghurt are less versatile. They are nonetheless useful in sauces, cold soups, salad dressings and vegetable dishes (Willan, 1996, 68). Cheese stands as a food in its own right and with other ingredients where it features as a seasoning, flavouring or topping, or as a rich creamy filling in recipes (Willan, 1996, 68). However, due to the high fat content of most cheese-types, there is also greater consumer demand for lower the cheese content of cheese-containing dishes (Praw *et al.*, 2002)

Milk performs a number of important functions, but most recipes require milk or cream to be fresh (Willan, 1996, 68). It can be used to dissolve salt and sugar and it makes the ionisation of, for instance, sodium bicarbonate and potassium acid tartrate in the baking powder possible, so that carbondioxide, the raising agent, can be formed (Charley & Weaver, 1998:199). Milk disperses the fat and the flour and hydrates the protein and starch in the latter. The milk also provides some steam to leaven the cake (Bennion, 1995:424).

In baked goods milk gives a softer, whiter colour than water. Dry milk has a similar effect without adding liquid (Willan, 1996, 345)

Milk or cream is commonly used as a foam when it is whipped. Its taste, whether sweet or nutty, and the amount of fat in the cream, is important in making a foam (Willan, 1996, 69; Mehas & Rodgers, 1991: 263). The higher the fat level, the better the foam. Temperature is also crucial in making good foam. Cold temperatures increase the viscosity of the cream. The amount of cream affects the quality of the foam. Whipping small amounts usually produce better results than whipping large amounts. Adding sugar decreases both the volume and stiffness of the foam, as well as the time it takes the foam to form (Mehas & Rodgers, 1991: 263).

Heating causes a variety of reactions in milk. Some of these reactions are desirable, while others are not. Milk must therefore be handled carefully when heated. Heat denatures and coagulates the whey proteins of fresh milk, causing them to precipitate. Heating can also cause milk to curdle. Curdling generally occurs only at high temperatures when other factors that affect milk are also present. In general it is best to use fresh milk, low temperatures and non-acid foods when cooking with milk. This will prevent curdling in foods such as custards or cream soups (Mehas & Rodgers, 1991: 264-265).

2.4.4 Eggs

Nutritional and health benefits Whole egg contains about 75% water, 12% protein, 10% fat and 1% minerals. (See Table 2.5 for more data on nutrient content). The egg white and yolk differ in its composition (Bennion, 1995:387). The white contains a larger percentage of water (Bennion, 1995:387). Egg yolk is approximately 50% water, 33,3% lipid and 20% protein

Of all the protein foods, eggs are the most ideal in terms of amino acid content for human needs, also reported in draft legislation for food labelling and marketing (South African Department of Health, 2002). The protein to fat ratio is higher in eggs than in most meat (Bennion & Scheule, 2000:412). Aside from water chief constituent of egg white aside from water is protein. Ovalbumen is the main protein in egg white and contains a high proportion of the sulphydryl groups. Proteins of the yolk include vitellin, present as a complex with lipid and referred to as lipovitellin. Phosvitin, a phosphoprotein, as a vitellin, binds more than 80% of the iron of the yolk. Livetin, a sulphur-containing globular protein, and low-density lipoproteins are also found in the yolk (Charley & Weaver, 1998:343). Essentially all the fat of the egg is found in the yolk (Bennion, 1995:387). The yolk contains more minerals and vitamins comparative to its weight (Bennion, 1995:388). The high lipid content of the yolk accounts for the fact that roughly 75% of the kilojoules supplied by an egg comes from the yolk (Bennion, 1995:387). The fatty acids esterified with glycerol are oleic, palmitic, stearic and linoleic, in descending order. The main phospholipid is lecithin, with some phosphatidyl ethanolamine and a small amount of phosphatidyl serine. Egg yolks are a good source of biologically available iron and vitamin A, as well as the B vitamins, thiamin and riboflavin (Bennion & Scheule, 2000:413).

Obviously in a diet where eggs are to be excluded, careful attention should be given to appropriate nutritional alternatives, which are also high in the nutrients that eggs provide in the diet, namely energy and especially the egg yolk is high in calcium and phosphorus.

Culinary properties Egg plays a role as an ingredient in dishes, but also performs a dozen additional roles in cooking. When heated, egg white promdes structure to a mixture, while egg yolk makes it smooth, rich and lightly thickened. Eggs are important in enhancing soups and sauces and in binding stuffing and purées. In baked custards the egg white sets the milk or cream until firm, while the egg yolk enriches it. Egg whites are also used to clarify stock for consommé and aspic. Whole eggs or egg yolks are excellent golden glazes for breads and pastries. Similarly, whole eggs, alone or mixed with a tablespoon or two of water or oil, act as a binder in the coatings for foods to be deep-fried (Willan, 1996, 80).

The protein in eggs, in addition to aiding in the aeration of single-stage cake batters, also serves as a means of incorporating air (foam) into cake batter made by conventional creaming, especially when the eggs are separated and the whisked whites are folded into the batter at the end (Willan, 1996, 322; Charley & Weaver, 1998:445) and balances the tenderising effect of sugar. Foams are important in many recipes, because they aerate foods.

Egg yolk, especially the plasma with low-density lipoprotein has a major contribution to the quality of shortened cakes. The higher the proportion of fats the greater the need for the emulsifying action of egg and especially the yolk. Yolk behaves as an emulsifying agent, a property attributes to its high phospholipid content and the fact that the all the lipids, including the triglycerides, appear to be associated with at least two of the proteins, vitellin and vitellenin.

2.5 SUITABLE REPLACEMENTS FOR ALLERGENS

To replace allergens in recipes, the recipe developer needs to have a sound knowledge of other ingredients suitable as replacements for these allergens.

2.5.1 Substitutes for wheat

The type of substitute for the grain allergic child mainly depends on if the child is allergic to wheat or maize/corn. If the child is allergic to both, only substitutes that are free from both may be used.

In the case of the **wheat** (not gluten) allergic child the following can be used as substitutes (Steinman, 2002; Griffiths, 1986:42-45):

barley - whole hulled, flakes, flour; kamut - whole, flakes, flour, pasta; oat - scotch style, flour, oat bran, rolled flakes; rye - flakes, flour, bread, crackers (if 100% rye); spelt - whole, flakes flour, pasta.

In baking the following quantities equal to120 g of wheat flour: oats: 133 g; rye flour: 130 g; 65 g rye flour + 68 g potato flour; 87 g rye flour + 48 g potato flour; 43 g rye flour + 86 g rice flour; barley: 82g.

1 part rice flour + 1 part soy flour + 1 part potato flour (always include 1 high protein flour e.g. soy or lentil)

Coarser meals and flours need more leavening. It is advisable to use 1.5 g baking powder for each cup of course flour. Sago flour can be used to thicken soups, sauces and stews. Pearl sago and pearl tapioca can be made into puddings with milk. Arrowroot is an excellent thickener. Rice flour, potato flour, barley flour and rye flour should all be used as thickeners with care, as they tend to be lumpy.

2.5.2 Substitutes for soy

In the case of soy it is best to just omit it from the diet, for vegetables of high protein value use other legumes, e.g. chickpea.

2.5.3 Substitutes for cow's milk

In the case of the cow's milk allergic child, the following can be used as substitutes for **milk** (Steinman, 2002; Griffiths, 1986:33-36):

Rice milk - increases sweetness, so decrease sugar in baked goods; almond milk; soy milk; oat milk; coconut milk; nut milks (blanched nuts with skins removed. Grind in food processor with a little water. Combine with 2-3 times amount of water. Refrigerate for a couple of hours and then strain through cheese cloth); horchata (this is a spanish beverage made with rice, almonds, or chufa); goat's milk (often provokes reactions to people who are already sensitive to cow's milk); sheep's milk (may provoke a cross-reaction in those sensitive to cow's milk); cashew milk (cashew nuts can be ground in a blender and mixed with water to form a cream substitute. Add honey and vanilla extract to taste and dilute further to makes cashew milk).

Ground almonds and creamed coconut can also be used to substitute cream.

In the case of the cow's milk allergic child, the following can be used as substitutes for **butter*** (Steinman, 2002):

Tahini - ground sesame seeds (can readily provoke allergy or intolerance); sunflower spread; clarified butter/ghee (tolerated by most milk sensitive people) and substitute butter in sauces with creamed coconut for certain foods.

Oil - use heavier oils like pure olive oil for frying, preferably Beta-carotene oil. Pie dough made with oil will be sand-like, not flaky but it is suitable for pressed pie dough.Vegetable shortening will make a flakier pastry rather than a rolled shell.

*Margarine may contain trace amounts of milk allergens, because of the extreme sensitivity of some consumers to particular food allergens it must best be avoided. (Taylor & Lehrer, 1996:S92)

In the case of the cow's milk allergic child, the following can be used as substitutes for **cheese** (Steinman, 2002; Griffiths,1986:34):

Goat's cheese, sheep's cheese, soy-based cheese spreads and tofu possible substitutes.
Goat's and sheep's cheese can provoke cross-reactions in people sensitive to cow's milk. Other options to consider for sandwich fillings besides cheese are: hummus, pate, taramasalata (a Greek dish made with smoked fish roe, olive oil, lemon juice and garlic), Gjetost (Norwegian brown cheese made from milk whey).

In the case of the cow's milk allergic child, the following can be used as substitutes for **sour cream** (Griffiths, 1986:35):

35 g permitted starch (maize meal/potato flour) + 187,5 g water + 62,5 g vinager. Stir starch in water and vinager mixture and use as required in recipes.

2.5.4 Substitutes for egg

In the case of the egg allergic child, the following can be used as substitutes for eggs (Steinman, 2002; Griffiths, 1986:38-40):

Eggless egg replacers are available in many health food stores. These are different from the reduced-cholesterol egg products, which do contain eggs. Egg replacers are egg-free and are usually in a powdered form.

Baking:

Eggs in recipes can often be replaced by adding 2-3 extra tablespoons (30 ml – 45 ml) of water for each egg eliminated to balance the moisture content of the product.

Replace eggs in baking with a mixture of the powdered egg replacer and water according to package directions.

1 heaped tablespoon of soy flour or corn starch plus 2 tablespoons of water per egg in a baked product.

30 g of mashed tofu per egg.

In muffins and cookies, ½ mashed banana can be used instead of an egg, though it will change the flavour of the recipe and dish will have a close texture.

Binding:

For vegetarian loaves and burgers, use any of the following to binding ingredients together: tomato paste, mashed potato, moistened breadcrumbs, rolled oats.

Each of these is the replacement of 1 egg as a binder: ½ large mashed banana, 62½ ml apple sauce or pureed prunes, 15 ml ground flaxseed mixed with 45 g water or 25 g water, 25 g oil, and 4 g baking powder.

Whipping:

1 ml xanthum gum with about 60 ml of water. Let stand. It thickens, and can be whipped like an egg white. Carboxyl methyl cellulose also has many applications for binding and whipping when it could replace egg.

Cooking:

When preparing baked flour mixtures, especially scones, the egg is usedfor flavour and texture. Replace with 15 ml of apricot puree and 10 ml additional oil.

2.6 MENU PLANNING

In French "menu" means "small, slender detailed", referring to the finer details of a meal (Kreck, 1975:3; Swanepoel, Loubser, Visser, 1992:29). A menu is a list of menu items, which are available to a consumer at a given time (Swanepoel, Loubser, Visser, 1992:29). Eckstein (1978:1) said that menu planning determines which items will be serve and at what time.

Cycle menus are a carefully planned series of menus that offer different items from day to day for a specific period of time, after which the menus are repeated (Spears, 1995:148; Swanepoel, Loubser, Visser, 1992:31). If weekly cycles are used it is wise to begin the cycle on a mid-week day instead of a Sunday or a Monday, so that if the menu is disrupted it does not happen over a weekend when a household operates differently to the the rest of the week (Swanepoel, Loubser, Visser, 1992:31). If the same people in the household are to follow the menu cycle it is wise not to make it for a too short period of time to prevent boredom (Swanepoel, Loubser, Visser, 1992:31).

Menu cycles have many advantages. After the initial planning has been completed, more time is available for the food preparer to review and edit menus depending on holidays, vacations, changes in household and unavailability of food or the use of new menus. Repetition of the same or nearly the same menu, assists in standardising preparation procedures, giving the food preparer an opportunity to become more efficient in

planning and coordinating their work and utilising their time efficiently. Food purchasing is also simplified (Spear, 1995:148; Swanepoel, Loubser & Visser, 1992:31-32).

The combination of food items on the menu is important. When a menu is planned the planner has to look at colour, texture, consistency, flavour, shape, presentation, method of preparation. The colour of the various dishes on the plate is important as it gives visual appeal to the food (Swanepoel, Loubser & Visser, 1992:29).

Texture refers to the internal and external structure of the food and this can best be detected by the mouth-feel of food. Crisp, soft, grainy, smooth, hard and chewy are use to describe food texture. Care must be taken to provide contrast in texture, by for example, offering crisp foods and soft foods together (Swanepoel, Loubser & Visser, 1992:32-33).

Consistency is the term used to describe degree of firmness, density or viscosity of the foods. The terms runny, gelatinous and firm describe food's consistency, while the terms thin, medium and thick are used to describe the consistency of sauces (Swanepoel, Loubser & Visser, 1992:33). Flavour combinations in the meal should be carefully considered. In addition to the basic flavours of sweet, sour, bitter or salt, there are strong, mild, spicy or highly seasoned foods. A variety of flavours within the meal are more enjoyable than duplication of any one flavour (Swanepoel, Loubser & Visser, 1992:33).

The shape of food portions, as well as the presentation of the food has an effect on visual appeal. The menu developer must visualise the food on the plate to have an idea how the served meal would appear to the person eating it. The method of preparation must also not repetated, because it can be boring (Swanepoel, Loubser & Visser, 1992:29).

A set procedure has to be developed when a menu cycle is planned. The length of the cycle must first be decided on, whereafter a systematic approach must be used to select the menu items. The most well-known and commonly used method is to select all the main menu items for the entire dinner cycle. These are the most expensive items on the menu and cost can be controlled to a great extent through careful planning at this stage. The items planned must be very specific on method of preparation and detail, so that it is simpler to plan the other meals from there. After selecting the main menu items for dinner, select the main menu items for lunch, for the entire menu cycle (Swanepoel, Loubser & Visser, 1992:30).

Following this stage the main menu items for breakfast is planned, and the starches are allocated to the dinner, lunch and breakfast - in that order. Vegetables, fruits and salads are then divided between the three meals (Swanepoel, Loubser, Visser, 1992:32-34).

The planned menu cycle needs to be evaluated to ensure that it fulfils the set criteria. To accomplish this, the entire day should be check vertically on the menu form for adequacy in all respects for each day, and horizontally for duplication and repetition (Swanepoel, Loubser, Visser, 1992:34). Swanepoel, Loubser, Visser, (1992:35) developed a checklist to assure that all the different aspects of the menu are considered. The most important criteria in the checklist are: (i) Does it meet the requirements of the basic food groups for nutritional adequacy? (ii) Are the menu items offered in season and within the budget? (iii) Do the menu items in each menu offer contrast in colour, texture, flavour, consistency, shape or form, type of preparation and temperature? (iv) Can these menu items be prepared with the time and equipment available? (v) Is the workload balanced? (vi) Is any food item or flavour repeated too frequently during the specific menu cycle?

(vii) Are the menu items suitably garnished to improve their appearance and attractiveness? (viii) Are the combinations of menu items pleasing to the consumer?

Household recipes mostly have a yield of four to six portions. Typical yields for these recipes also match household cooking and baking utensils. Household recipes can be adapted when larger yields are required for larger families (Swanepoel, Loubser & Visser, 1992:9).

When recipes are selected they must be evaluated for suitability and quality. During evaluation the developer must look for: (i) sensory quality or acceptability, (ii) ease of preparation, (iii) availability of ingredients; (iv) suitability for the menu and cost (Swanepoel, Loubser & Visser, 1992:14,17).

When an existing recipe is used, the recipe can successfully be adapted in a few ways. A well-used method is to adapt the proportions of the ingredients, or the elimination or addition of an ingredient (Swanepoel, Loubser & Visser, 1992:14). This usually influences taste and/or the texture of a product. When recipes are developed for the food-allergic individual ingredients containing allergens are eliminated from the recipes and substituted by alternatives. Preparation procedures, portion size and suggested garnishing can also be altered (Swanepoel, Loubser & Visser, 1992:14).

The format of a standardised recipe is also very important. The format of the recipe must be easy to follow, to the point and attractively presented. The same pattern should be followed for all recipes. Uniformity in the style of writing recipes is also important (Swanepoel, Loubser & Visser, 1992:19). There are basically three recipe formats, described as standard, narrative and action. The standard format is the one most commonly used. The ingredients are listed first and then separated from the method or procedure. The metric measures appear on the left and/or right hand side. The procedure then follows in paragraphs or steps, with the recipe yields in the "amount" column. The narrative format is best used when space is limited and when recipes are short and uncomplicated. In this case the measures and/or weights of the ingredients are included in the method. The action format is a variation of the standard format where procedures are written in steps. The action word or key steps are emphasised by listing it first and/or in bold print (Swanepoel, Loubser & Visser, 1992:19).

To determine which recipe format would be most suited for each situation some of the following characteristics of the recipes and circumstance should be taken into consideration. Firstly the complexity of the recipes, the end-use (if it will be use for mass catering or home cooking), the amount of space available to write the recipes, criteria set and the visual preference by users (Swanepoel, Loubser & Visser, 1992:20) should all be considered.

Which information to include in a recipe depends greatly on the needs and preferences of the users, although all recipes should carry basic information. This information includes an indication of how much the recipe produces, the ingredients, equipment, utensils and preparation time, procedures to follow, expected yield, portion size to serve, serving method (Swanepoel, Loubser & Visser, 1992:21). The title of a recipe should be brief, descriptive and must be easy to recognise. If it is not easy to recognise it must be followed by a short description (Molt, 2001:5; Swanepoel, Loubser, Visser, 1992:21). Names of ingredients should be listed in the order in which they are used in preparation (Molt, 2001:5).

2.6.1 Goals for menu planning

Family meals are not instant, they require money, time, personal effort, human energy and mechanical energy. Further, personal skills and abilities are essential to the planning, purchase, preparation and service of meals. Meal management is a highly cognitive task - requiring attention, thinking, judgement and planning (Kinder & Green, 1978:1).

There are at least four general goals related to meals. The first goal is good nutrition, the second that meals should not cost too much, but stays within the planned budget for food. The third goal is that the meals should be the kind the family would want to eat, while the last goal is to fit the responsibility for meal planning and preparation into planned use of time, energy and other resources (Kinder & Green, 1978:6-7).

When criteria are develop for allergic consumers it is important to remember that they too have to consume a balanced healthy diet and that they can also have other medical problems like obesity, diabetes, constipation, heart diseases, cancer, irritable bowl syndrome and arthritis and thus need to consume food with a variety of advantages. Furthermore, no allergens or substances that may have a cross-reaction with the forbidden proteins (allergens) may be included in the allergen-free recipes. Care must be taken when the recipes are developed to avoid the "harmful" substances. The menu planning goals become the pillar for the development of the two-week menu cycle.

2.6.1.1 Achieving nutritional adequacy

Studies of diets revealed that some families are well-fed although not all persons within each family are equally well-fed. Perceptible changes in the national food habits would suggest a principal shift to nutrition, however this is not always the case. The universal desire for the normal growth rate of children and the understanding that health is also determined from the right food are values that underline this goal. Because these values may be in conflict with others, some persons fail to consume an adequate diet although the right foods may be available in large quantities.

Concepts of nutrition are moving from essentially to optimality (Schenker, 1999:111) with different guides and criteria to meet optimality. Optimal nutrition helps children to be healthy - a state of complete physical, mental and social well-being, and not merely to be free of disease (Kruger, 2001:11). For menu plans to accomplish nutritional adequacy the following aspects, apart from the food allergens already discussed, require further investigation: (i) The Recommended Dietary Allowances (RDA); (ii) The Dietary Reference Intake (RDI); (iii) South African Dietary Goals (iv) World Health Organisation Dietary and Health Goals; (v) Food-Based Dietary Guidelines; (vi) Food guides (vii) Functional foods (including nutraceuticals and phytochemicals).

2.6.1.1.1 The Recommended Dietary Allowances (RDA)

The RDA can be defined as the amount of a nutrient needed to meet the requirements of nearly all (97% - 98%) of the healthy population (Thomas, 2000:333). The RDA is used as criteria for the labelling and marketing of food for adults and children over the age of ten years (South African Department of Health, 2002:58). The RDA of the United States of America is divided into categories according to gender and age. The RDA contains a list of twenty nutrients with their respective units of measurement and the recommended amount that must be consumed daily to maintain optimum health. In South Africa it was found that the

macronutrients and the micronutrients that are deficient according to the 'National Food Consumption Survey in children aged 1-9 years: South Africa' (Vitamin Information Centre, 2001) are energy, calcium, iron, zinc, selenium, Vitamin A, D, C, E, B_6, as well as riboflavin and niacin.

2.6.1.1.2 The Dietary Reference Intake (DRI)

The Dietary Reference Intakes (DRI) is a set of four nutrient-based reference values for the intake of nutrients and food components that can be used for planning and assessing the diet of healthy people (Murphy & Barr, 2001:4; Smolin & Grosvenor, 2000:G5), namely adequate intake (AI), estimated average intake (EAR), Recommended Dietary Allowance (RDA) and tolerable upper intake level (UL) (Thomas, 2000:333).

RDIs provide a large margin of safety. The DRI for a nutrient is greater than the RDA (Thomas, 2000:355-356). Thus the DRI model expands on the earlier RDA (see Table 2.6) which focused on establishing adequate intakes of nutrients for healthy populations to prevent deficiency diseases (Thomas, 2000:335). The DRIs are being developed to consider health promotion and a reduction of chronic diseases as well as the prevention of deficiencies (Smolin & Grosvenor, 2000:34).

TABLE 2.6: RECOMMENDED DIETARY ALLOWANCES (South African Department of Health, 2002:53)

Nutrient	Unit of measure-ment	Adults and children over 10 years of age
Protein	g	50
Vitamin A	µg RE	800
Vitamin D	µg	10
Vitamin E	mg a-TE	10
Vitamin C	mg	60
Vitamin B_1 or thiamin	mg	1.4
Vitamin B2 or riboflavin	mg	1.6
Niacin	mg	18
Vitamin B_6 or pyridoxine	mg	2
Folic acid or folacin	µg	400
Vitamin B_{12}	µg	2.4
Biotin	µg	30
Panthothenic acid	mg	5
Calcium	mg	1200
Phosphorus	mg	880
Iron	mg	14
Magnesium	mg	350
Zinc	mg	15
Iodine	µg	150
Choline	mg	480

* This age group does not reflect the established grouping (see Table 15.1, p334 Earl and Borra, 2000) that is the grouping used by Department of Health, 2002:58, nor does it reflect the USA RDA values for the age group 7-10 which was used in the study (.see Chapter 5).

The DRIs are being developed for seven nutrient groups: calcium, phosphorus, magnesium, vitamin D and fluoride; B vitamins and choline; antioxidants (e.g., vitamin C, vitamin E, selenium); macronutrients (e.g., protein, fat, carbohydrate); trace elements (e.g., iron, zinc, copper); electrolytes and water; and other food components (e.g., fibre, phytochemicals) (Smolin & Grosvenor, 2000:33).

Presently in the draft legislation some of the RDAs have already been substituted by DRIs (South African Department of Health, 2002:53-54) and eventually all the RDAs will be replaced by DRIs (Booyzen, Antoinette, Personal communication, 2000).

2.6.1.1.3 South African Prudent Dietary Goals and the World Health Organisations Dietary and Health Goals

The South African Prudent Dietary Goals are stipulated in the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2002:59) (Annexure 3, number 2), while the WHO Dietary and Health Goals were included in the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2001:44); both these goals include the same nutrients, but the WHO Dietary and Health Goals are more descriptive.

The South African Prudent Dietary Goals are dietary recommendations for healthy South Africans about food choice that promote health specifically with respect to prevention or delay of chronic diseases (South African Department of Health, 2002:57). The dietary guidelines have regulations about the total amount of energy (the energy contribution is also specified, hereby indicating the respective contribution of each to the fat-energy, carbohydrate-energy and protein-energy) cholesterol, dietary fibre and sodium that should be consumed daily (See Table 2.7), and are an estimation of the saturated fatty acids, mono- and polyunsaturated fatty acids' contribution to the total energy (South African Department of Health, 2002:54-55).

TABLE 2.7A: THE SOUTH AFRICAN DIETARY GOALS (South African Department of Health, 2002:54-55).

Total energy	to achieve and maintain a normal weight
Protein	12 -15% of total energy
Glycemic carbohydrates	50 - 60% of total energy
Fat	25 - 30% of total energy
• Saturated	10% of total energy
• Polyunsaturated	10% of total energy
• Monounsaturated	10% of total energy
Cholesterol	less than 300 mg per day
Dietary fibre	30 – 40 g per day
Sodium	less than 3 000 mg per day

According to the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2001:59) the WHO's recommendations on diet and health are stipulated in Table 2.7B. This is included in the 2001 copy of the Draft legislation, but was not included in the 2002 copy. The WHO Dietary and Health Goals also stipulate the energy contribution by fats, carbohydrates and protein, as the The South African Prudent Dietary Goals but more detaile is included. The values between the two sets of goals are nearly the same although there is some differences, for example the sodium and dietary fibre amounts. The WHO Dietary and Health Goals included extra goals that are absent from the Table 2.7. These are Fruits and Vegetables, Goals for physical activity and Goals for body mass index (BMI).

TABLE 2.7B: WHO DIETARY AND HEALTH GOALS

Ranges of population's nutrient intake goals	
Total fat	15-30% energy
Saturated fatty acids (SFA)	<7% energy
PUFAs	6-10% energy
n-6 PUFAs	5-8% energy
n-3 PUFAs	1-2% energy
Trans fatty acids	<1% energy
MUFAs	By difference
Total carbohydrate	55 to 75%
Free sugars	<10% energy
Protein	10-15% energy
Cholesterol	<300 mg/day
Sodium chloride (Sodium)	<5 g/day (<2g/day)
Dietary fibre	20-25 g/day
Fruits and vegetables	>400 g/day
Goals for physical activity A total of one hour per day on most days of the week of moderate-intensity activity, such as walking, is needed to maintain a healthy body weight, particular for people with sedentary occupations.	
Goals for body mass index (BMI) BMI	Population (adult) mean of 21 kg/m^2 For individuals: 18.5 – 24-9 kg/m^2 and avoid weight gain during adult life (>5kg)

2.6.1.1.4 Food-Based Dietary Guidelines (FBDG)

These dietary guidelines aimed at replacing the Five Food Group system. The application of this newly acquired set of food-based dietary guidelines for nutrition in various educational settings is still being debated (see next page). The four principles recommended for developing countries by the WHO/FAO (South African Sugar Association, 1997) are: (i) The human body is a very adaptable organism and a variety of dietary patterns and food intakes can lead to good health and nutritional well-being; (ii) There are no good or bad foods, *per se,* only good or bad diets; (iii) A diet can only be judged good or bad in relation to a number of variables, ranging from a consumer's physiological status to physical activity levels, life style choices and environmental considerations; (iv) Positive, non-coercive messages can be most effective in helping people make wise food choices.

In South Africa there is coexistence of under- and over-nutrition in the population and also within the same households (Love, Mauder, Green, Ross, Smale-Lovely & Charlton, 2001: 9). That makes the development of adequate guidelines very difficult. It is likely that the dietary and health messages currently being used to promote healthy diets and life styles are inappropriate, because they do not reflect the country's specific health issues. Poor coverage, inadequate educational materials and inconsistent messages may also be contributing factors to the nutrition situation in South Africa (Love *et al.*, 2001: 10). Food-based dietary guidelines for at least 20 countries exist and in the majority of them there is agreement on the following

recommendations (Vorster, Love & Brown, 2001:S3): (i) eat a nutritionally adequate diet composed of a variety of foods; (ii) adjust energy balance for weight control; (iii) eat plenty of foods containing carbohydrates and fibre, (iv) use fat, particularly saturated fat, sparingly; (v) use salt sparingly; (vi) drink alcohol in moderation, if at all.

The South African Food-Based Dietary Guidelines (FBDG) were developed by the Nutrition Society of Southern Africa in 1997 and has been revised (Love, Penny. Personal communicaion, dietitian. 12 June 2001). The South African food-based guidelines (Vorster, Love & Brown, 2001:S3) are the following: (i) Enjoy a variety of foods, (ii) Be active! (iii) Make starchy foods the basis of most meals; (iv) Eat plenty of fruits and vegetables every day; (v) Eat dry beans, peas, lentils and soy regularly; (vi) Meat, fish, chicken, milk or eggs can be eaten every day; (vii) Eat fats sparingly; (viii) Use salt sparingly; (ix) Drink lots of clean, safe water; (x) If you drink alcohol, drink sensibly.

2.6.1.1.5 Food Guides

The Food Guide Pyramid is not a rigid prescription of what people must eat, but rather a general guide for healthy eating (Kennedy, 1998:183-184; Nesle, 1998:197). The aim of the USDA Food Guide Pyramid is to link consumers' nutritional needs, dietary guidelines and general food patterns (Kennedy, 1998:183). The Food Guide Pyramid is based on three essential concepts: balance, variety and moderation. The five major food groups consumed – Bread, Cereals and Pasta Group, Vegetable Group, Fruit Group, Meat, Fish, Poultry and Drybean Group, Milk, Cheese and Yoghurt Group and Fats, Oils, Sweets – and the number and sizes of servings specified provide the basis of a healthy diet (see Figure 2.1).

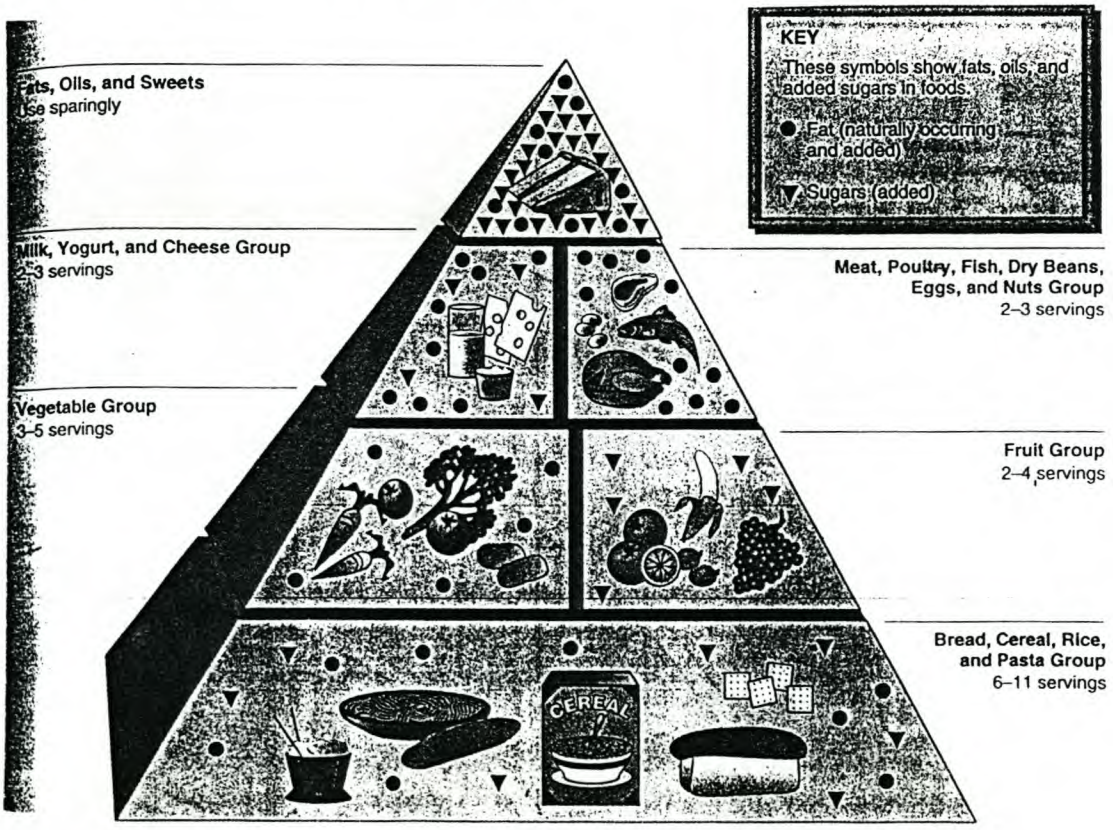

FIGURE 2.1: THE USDA FOOD GUIDE PYRAMID

All the pyramids, whether the Mediterranean, Asian or Vegetarian are based on the same building blocks: grains, vegetables and fruits. The similarities in the different pyramids are more dominant than are the differences (Kennedy, 1998:184). The Mediterranean and Asian diets will be discussed as well.

The Mediterranean diet is considered beneficial, not only because of lower saturated and high monounsaturated fats, but because it is rich in micronutrients that act by a variety of mechanisms to reduce the risk of heart disease (Brand-Miller & Foster-Powell, 2000:57). The basis of the Mediterranean Diet pyramid is mostly food from plant sources, including fruits, vegetables, potatoes, breads, beans, pasta, rice, couscous, bulgur, nuts and seeds (Smolin & Grosvenor, 2000:A171). These foods contain potentially protective nutrients, namely phytochemicals (Brand-Miller & Foster-Powell, 2000:58). The fruits and vegetables used are usually fresh with a minimum of processing. Olive oil, cheese and yoghurt also represent a large proportion of the daily intake of the Mediterranean Diet. Olive oil replaces the other fats, oils, butter or margarine that might be used. Fish, poultry, eggs and sweets are only eaten a few times per week and in descending order as named. Red meat is eaten only a few times per month and the lean cuts are favoured. In the Mediterranean Diet Pyramid the consumer's life style is also a focus area. Along with the eating pattern, wine must be used in moderation and the consumer must engage in regular physical activity to promote healthy weight, fitness and well-being (Smolin & Grosvenor, 2000:A171)

The Asian diet is characterised by rice. It is the staple food consumed in large amounts at all meals (Brand-Miller& Foster-Powell, 2000:73). The Asian Diet Pyramid (Smolin & Grosvenor, 2000:A172) also has grains and breads as a basis, with the difference that rice plays a larger role and is more dominant. The grains are minimally refined. Fruits, vegetables and legumes, nuts and seeds are also consumed in large amounts. The legumes, nuts and seeds are taken in larger amounts than is the case with the Mediterranean diet. A variety of vegetable oils are consumed daily. Fish and shellfish are optional for daily intake (Smolin & Grosvenor, 2000:A172; Brand-Miller & Foster–Powell, 2000:73). Dairy foods are generally not part of the healthy, traditional diets of Asia, with the notable exception of India. In light of current nutritional research, dairy foods, if consumed on a daily basis, should be used in low to moderate amounts and preferably be low in fat. Sweets, eggs and poultry can be consumed on a weekly basis, or more often, but then in very, very small amounts, while meat is consumed monthly.

Wine, beer and other alcoholic beverages should be consumed in moderation and primarily with meals and avoided whenever consumption would put the consumer or others at risk. Physical activity is also very important in the Asian diet (Smolin & Grosvenor, 2000: A172).

2.6.1.1.6 Functional foods (including nutraceuticals and phytochemicals)

Functional foods are defined as substances that may be considered to be food or biologically active food substances that provide medical or health benefits (Bayerl, 2000:322; Nathan, 1994:329), or as food having health-promoting benefits and/or disease-preventing properties over and above its usual nutritional value (Schenker, 1999:108). Functional foods have also been defined as normal foods and part of the daily diet, but they contain a component that benefits some particular physiological function (Anon, 1999:98; Nathan, 1994:329). Functional foods are part of what is often referred to as the 'second generation' of biotechnology, delivering a supposed benefit for the consumer rather than the producer.

It is important to note the distinction between fortified foods and functional foods. Whereas fortified foods are primarily used to help prevent nutritional deficiency, the broader category of functional foods goes beyond nutrition, helping to prevent or treat disease and advance the overall health of a consumer (Chaudhari, 1999:94; Shortt, 2001:70).

While functional foods is a relatively newly understood scientific phenomenon in Western cultures, traditional chinese medicine recognised functional foods from as early as 1000 BC. Food and medicine are from the same source, based on the same theories and have the same uses (www.corporatewatch.org/publications/GEBriefings/funcfood). According to Sloan (1999:40) nutraceuticals are the fastest growing segment of the food industry today.

The components of functional foods with a plant origin are called phytochemicals. Phytochemicals are non-nutritive substances in plants that possess health-protective effects (Craig, 1997:510). Scientific evidence to stress the importance of phytochemicals are becoming extremely trendy and persuasive, with various researchers working in the field. Researchers are exploring the phytochemical components of traditional foods, like beta-carotene and other carotenoids that may be responsible for health benefits. There is an enormous amount of nutraceuticals and phytochemicals in the every day foods. Because their additional health benefits are a new understanding of previous limited insight into the nutritional value of food (mainly pertaining only to the nutrients in food) it a very interesting research topic. Table 2.8 gives a summary of the benefits of phytochemicals that have been studied extensively.

A major advantage of phytochemicals is that most phytochemicals are heat stable and are not significantly lost in cooking water. The availability of carotenoids and the level of indoles in the broccoli actually may be increased during cooking (Craig, 1997:S200).

There are literally thousands of compounds in our diet that are investigated and on the edge of being defined as essential for health. These are the ingredients that are considered functional food ingredients. There is a grey area between essential nutrients and functional food ingredients. An essential nutrient provides for growth and maintenance. A decline in body functions can be measured when essential nutrients are removed from the diet and the reaction can be reversed when the essential nutrients are added back into the diet. Functional food ingredients appear to be more associated with long-term health. This and the absence of the disease cannot be judged or evaluated in the short term (Anon, 1999:98)

TABEL 2.8: FUNCTIONAL FOODS, THE RESPECTIVE PHYTOCHEMICALS, ORGANISMS OR COMPONENTS AND THEIR ADVANTAGES

PHYTOCHEMICAL/ ORGANISM/COMPONENT	FUNCTIONAL FOOD	POTENTIAL BENEFITS
Carotenoids		
Canthaxanthin	Edible mushrooms, marine fish,	Enhances immune response, slows down tumor growth, prevents/delays
	shellfish, algae	photocarcinogenesis, protects agains lipid peroxidation, antioxidant
Carotene	Carrots	Neutralises free radicals which may cause damage to cells
	Various fruits, vegetables	Neutralises free radicals
Lutein	Green vegetables	Contributes to maintenance of healthy vision
Lycopene	Tomatoes and tomato products	Inhibits growth of tumor cells, inhibits lipid peroxidation,
	(ketchup, sauces etc.), red pepper	protective association for cervical intraepithelial neoplasia,
	pink grapefruit, watermelon, guava	prostrate, gastric and lung cancer, act as an antioxidant.
Dietary fibre		
Insoluble fibre	Wheat bran	May reduce risk of breast and/or colon cancer
Soluble fibre	Psyllium	Reduces risk of cardiovascular disease (CVD), increases fecal bulk
Fatty acids		
Conjugated linoleic acid	Cheese, meat products	May improve body composition, may decrease risk of certain cancers
Flavonoids		
Anthocyanidins	Fruits	Neutralise free radicals, may reduce risk of cancer
Catechins	Tea	Neutralise free radicals, may reduce risk of cancer
Flavonones	Citrus	Neutralise free radicals, may reduce risk of cancer
Flavones	Fruits and vegetables, honey	Neutralise free radicals, may reduce risk of cancer
Epigallocatechin gallate	Green tea	Reduces risk of gastric tract, digestive tract, colon, esophagus
(EGCG)		and breast cancer, lowers cholesterol levels, reduces risk of coronary heart diseases,
		antioxidant activity, reduces collagenase activity, antimicrobial activity,
		enzymatic regulation, enhances immune effects, inhibits reductase activity,
		prevents HIV-induced cytopathic effect, inhibits platelet aggregation
Quercetin	Onions, kale, broccoli, red grapes,	Reduces risk of cancer, inhibits LDL oxidation, reduces risk of CVD,
	cherries, apples, cereals, tea	affects fertility, inhibits platelet aggregation, inhibits cell proliferation,

TABEL 2.8: FUNCTIONAL FOODS, THE RESPECTIVE PHYTOCHEMICALS, ORGANISMS OR COMPONENTS AND THEIR ADVANTAGES (continued)

Glucosinolates, indoles,		
Isothiocyanates		
Sulphoraphene	Cruciferous vegetables (broccoli),	Neutralise free radicals, may reduce risk of cancer
	horseradish, watercress, mustard,	
	papaya.	
Phenols		
Caffeic acid	Fruits, vegetables, citrus	Antioxidant-like activities, may reduce risk of degenerative diseases:
Ellagic acid		heart disease, eye disease, anticarcinogenic activity
Ferulic acid		and inhibit atherosclerosis
Sesamol		
Vanillin		
Plant Sterols		
Sterol ester	Corn, soya, wheat, wood oils	Lowers blood cholesterol levels by inhibiting cholesterol absorption,
		reduce risk of CVD and cancer
Phytosterol	Vegetable oil, wheat germ oil,	Decrease cholesterol absorbtion, reduce incidence of gallstones,
	corn oil, rice bran, sesame seed,	reduce risk of breast cancer
	almonds, corn, peas.	
Prebiotics		
Fructo-oligosaccharides	Jerusalem artichokes, shallots,	May improve gastrointestinal health, increase bifidobacteria,
Inulin	onion powder, banana, garlic,onion	lower hepatic glucose production, lower fasting glycemia and serum
	leeks, asparagus, rye, barley,	total cholesterol, reduce mineral excretion, decrease plasma triglycerides,
	honey	phospholipids, mixed effect on cholesterol.
Probiotics		
Lactobacillus spp	Yogurt, other dairy	May improve gastrointestinal health, promote immune function,
		might be used in the treatment of food allergy, improve nutrient absorption,
		improvement of intestinal movement, reduction of serum cholesterol and lipids,
		antidiabetic effect, management of osteoporosis.
Saponins	Soy beans, soy foods, protein-	May lower LDL cholesterol; contains anticancer enzymes,
	containing foods, legumes	may reduce risk of cancer

TABEL 2.8: FUNCTIONAL FOODS, THE RESPECTIVE PHYTOCHEMICALS, ORGANISMS OR COMPONENTS AND THEIR ADVANTAGES (continued)

Soya proteins, Phytoestrogens		
Isoflavone:		
Daidzein	Soy beans and soy-based foods	May reduce menopause symptoms (hot flushes),
		may reduce risk of cancer, lower total cholesterol
Genistein		may protect agains heart disease; lower LDL and VLDL, increase HDL,
		lower total cholesterol and triglycerides
Lignans	Flax, rye, vegetables,soya	Lowers LDL cholesterol, maintain healthy immune system, cancer inhibitors
Sulfides, Thiols		
Diallyl sulphide	Onions, garlic, olives, leeks	May reduce the risk of colon and stomach cancer,
		reduced skin tumors, increases hepatic enzymes, inhibits platelet aggregation,
		can lower blood cholesterol and LDL cholesterol, inhibits cholesterol synthesis,
		has antimicrobial properties.
Allyl methyl trisulphide	Cruciferous vegetables	
Dithiolthiones		
Tannins		
Proanthocyanidins	Cranberries, cocoa, chocolate	May improve urinary tract health
		May reduce risk of cardiovascular disease

Sources: Bayerl, 2000:323; Chaudhari, 1999:94-95; Clydesdale, 1999:203-315; Clydesdale, 1999:1-127; Craig, 1996:S199-S203; Coulston, 2000:96-99; Eden, 1999:152-154; Prosky, 1998:271-275, Bell, Goldman, Bistrian, Arnold, Ostroff & Forse, 1999:189-202; Mattila-Sandholm et al., 2000:393-399; Schenker, 1999: 113; Roberfroid & Slavin, 2000:461-477, Walker, 1996:26-33; Winston, 97:S199-S203.

2.6.1.2 Matching meals to the budget for food

This goal is a real problem for the majority of meal planners. How much money for meals is "too much" depends on the extent of the financial resources, the financial commitments and the budget of a given family. There is a minimum essential cost for a nutritionally good diet. However, nutritionally adequate meals can be purchased at widely different levels of spending. The amount of money essential for feeding a family depends on the size of the family, the age of family members, the composition of the family and the region of residence. Love *et al.*, (2001:13) who did research on the South African Food-Based Dietary Guidelines, reported that one of the major constraint in the implementation of healthy eating habits is the affordability of products and lack of variety (Vitamin Information Center, 2000:4).

Rising food prices and rising energy costs, in addition to recession and inflation, cause shoppers to change their food-buying practices. Some families have limited financial resources in order to satisfy other needs and wants (Kinder & Green, 1978:7). The key principle concerning the cost of food should be to maintain a constant food cost everyday (Swanepoel, Loubser & Visser, 1992:20).

2.6.1.3 Achieving meals the family likes and wants

This goal offers explanations as to why consumers spend more time and money on meals than what is required for a nutritionally adequate diet, why some persons indulge, why some persons' diets are nutritionally inadequate and why some families spend more time and energy on meals than others do. All consumers have some food preference. These are learned (Kinder & Green, 1978:7). According to Love *et al.*, (2001:13) the household's taste preference can lead to the exclusion of certain foods. The kinds of meals consumers prefer are established by such influences as ethnic background, family customs, region of residence, socio-economic background, education, religion and the experiences they have had (Swanepoel, Loubser & Visser, 1992:20; Kinder & Green, 1978:7). Food preference does change with time (Kinder & Green, 1978:7).

2.6.1.4 Matching meals to available time

Time is required for planning and organising of meals. Time and energy are further also required for shopping, meal preparation and cleaning up afterwards. The readily acceptance of convenience foods and or the mixes and ready-mades, is evidence that the consumer places a high premium on time and wishes to save it. It also indicates that some consumers wishes to bypass the tiresome tasks of cooking. Time and energy are budgeted, as is money (Kinder & Green, 1978:7-9).

2.6.2 Different aspects of meals

There are three more relevant aspects that have to be taken into consideration, along with the menu planning goals, to assure that developed menus fit the families life style, when discussing meal management (Vosloo, 1988:52-56), namely the number of meals per day, meals eaten away from home and snacking.

2.6.2.1 The number of meals per day.

This indicates the meal pattern. Certain factors influence the meal pattern: (i) activities; (ii) facilities at work or at school for eating meals; (iii) facilities or supervision at home for providing meals for school-going children and other family members (iv) the importance attached to the nutritional function of meals (v) the importance attached to the social function of meals and (vi) managing expertise of the homemaker.

2.6.2.2 Meals eaten at or away from home.

Meals can be eaten at home or away from the home. The homemaker can make sure of the quality of the meals at home, if she applies the principles of good meal management. However, some meals are bought and eaten away from home. The onus is then on the consumer to select foods in keeping with healthy nutrition principles.

2.6.2.3 Snacking

The growing transference of the workplace away from home and ever-increasing consumer orientation have made it inevitable that the phenomenon of snacking is increasing (Sloan, 2000:8). There is no objection to eating snacks and to supplement the energy and nutrition requirements of the body (Smart Snacking http//www.health.iafrica.com/dietician online/weightloss & life style, 2001). However, attention should be paid to the nutrient density of the snack.

2.7 FACTORS THAT INFLUENCE THE FOOD CHOICE, FOOD SELECTION AND FOOD BEHAVIOUR OF CONSUMERS

The choice of food determines which nutrients enter the body and influences food production systems through consumer demands. The food choice process incorporates not only decisions based on conscious reflection, but also those that are automatic, habitual and subconscious (Furst, Connors, Bisogni, Sobal & Falk, 1996:247, Asp, 1999:287).

Food choice determines nutritional status and, in so far as there are influences of diet on health and disease, it is of vital importance to understand the processes by which choices are made. Only with an adequate understanding of the reasons for consumers' choice of foods can there be an attempt to change choices and hence influence dietary patterns in line with recommendations from those involved in promoting health (Shephard & Sparks, 1994:202).

There are a lot of frameworks and models available that try to show the relationship between different factors and their effect on consumers' food choice (Furst, *et al.*, 1996:251; Parraga, 1990:661; Roos, Lahelma, Virtanen, Prattala & Pietinen, 1998:1519). In this study relevant concepts of the framework by Vosloo (2001) will be discussed.

The following were identified as concepts that need investigation and will consequently be discussed: preference or taste, availability, convenience, family and life style, health consciousness, cultural influences and social economical status.

2.7.1 Preference or taste

Food preference refers to the like or the dislike of food. According to Love *et al.*, (2001: 13) the most important aspect of food consumption is whether the consumer likes the food. If consumers are asked why they buy a specific product, they frequently answer "I like it" (Parraga, 1990:663). Liked foods are those that are familiar, considered pleasant and are usually the ones eaten, so food preference predicts consumption. Disliked foods are rejected either because they are considered unpleasant or because they are unfamiliar foods that have never been tasted. Studies show that more foods are disliked than liked (Asp, 1999:289). Food preference play an important role in food selection because it gives an indication of the amount of satisfaction an individual anticipates from eating a food (Asp, 1999:289).

This principle is closely related to taste (Bell, Stewart, Radford & Cairney, 1981:24). Taste is described as the most important factor in food choice by 89% of the respondents to the 1998 Food Marketing Institute Survey of Food Shoppers. This trend has been stable for several years (Asp, 1999:289). People select foods based more on its taste and appeal, rather than the nutritional value or health advantages, unless they are confronted with a specific nutrition-related disease. "For most consumers, no matter what the health claim, taste still rules" (Mogelonsky, 1999:2). Thus food preference is also related to psychological and physiological perceptions of the sensory attributes of food. Other sensory attributes that contribute to food preference are texture, colour, shape, form, size of pieces and temperature (Asp, 1999:289).

2.7.2 Availability

In many parts of the world, food choices are limited because of availability. Geography, socio-economic status and facilities influence this (Love *et al.*, 2001:15; Parraga, 1990:662). Overall, availability can be described as food options that are accessible in the food system. Immediate availability refers to the readiness and convenience of a food. Availability is dependent on interrelated factors such as budget, potential margin, adequate storage, refrigeration, and consumer demand (Nestlé, Wing & Burch, 1998:52) and is an important aspect of food security (Love, Mauder, Green, Ross, Smale-Lovely & Charlton, 2001:16).

2.7.3 Convenience

In a study by Betts (1985:15), convenience in food preparation was found to be an important factor influencing frequency of consumption. The consumer wants to use foods that are convenient and interesting (Katz, 2000:11). According to Armitstead (1998:98) the ease with which food is prepared has a great influence on the food choice and the attitude towards that food.

2.7.4 Family and life style

The family appears to be an important factor in the development of food habits. Most children eat what is provided for them and absorb the family's attitude towards food. Habit has been shown to be significantly related to the consumption of sweet, salt, fatty foods and to coffee consumption (Shepherd & Sparks, 1994:214).

2.7.5 Health consciousness

Health-promoting qualities of food correlates positively with frequency of consumption (Betts, 1985:15, Bell *et al.*, 1981:23). Consumers with high nutritional knowledge are more likely to choose healthy food (Tepper & Nayga, 1997:307) than others.

Sloan (1999:40) reported Bob Messenger, publisher and editor of *Food Trends Newsletter,* stated "the demand for health will be replaced by a drive for a balanced diet". In the ten consumers and essential nutrition trends for 1998 the fourth key trend was healthy eating, while key trend number five focussed on functional foods. Key trend number four is outlined as follows: "Healthy eating – attention on ethical cuisine attracts consumers to plant-based eating patterns. Interest in vegetarianism and plant-based eating patterns continue to rise. Consumers are and will continue to be attracted to these food patterns as a basis for healthy living. Key trend number five states: Functional foods – consumer interest gains momentum for foods and ingredients that may play a role in optimal health" (Sloan, 1999:42).

"Healthy" takes on a new meaning as functional foods and nutraceuticals becomes mainstream. The natural healing properties of foods are emphasised by health organisations. Consumers are rediscovering nutrition as a potent, preventive agent. The "food therapy" movement emphasises that eating habits influences physical and emotional health and emphasise the medical value of food (McMahon & Cameron, 1998:19-24).

2.7.6 Cultural influences

Culture refers to the behavioural pattern, superstitions, beliefs, attitudes, values, customs, norms, symbolism and man-made items (goods) of a specific society or population. When modifying food intakes to meet dietary recommendations there are certain aspects of food habits that are difficult to change, such as the concept of meals, meal patterns, the number of meals eaten in a day, when to eat what during the day, how food is acquired and prepared, the etiquette of eating and what is considered edible as food (Asp, 1999:288).

Culture also established how people use food and thus affect food intakes. Food is always used to satisfy hunger and to meet nutritional needs. Food is used to promote family unity when members eat together. It can denote ethnic, regional and national identity. It is used socially to develop friendships, provide hospitality, as a gift, and as an important part of holidays, celebrations and special family occasions. In religious rituals and beliefs certain foods have specific symbolic meanings, or there may be prohibited foods or food taboos.

Food can be used to show status or prestige, make one feel secure, express feelings and emotions and to relieve tension, stress or boredom. Food controls the behaviour of others when used as reward, punishment or as a political tool in protests and hunger strikes. Because food has artistic characteristics, it is used as the subject of creative expression by cooks, artists, photographers, restaurants and advertisers to influence food choices (Asp, 1999:289).

Subcultures are distinguished, e.g. ethnic, religious, age and geographic subcultures (Parraga, 1990:661-665; Vosloo, 1988:93). In South Africa there are many ethnic groups with their own food customs and therefore different food choices (Vosloo, 1988:93). Many religious groups maintain certain laws relating to

food customs by placing a total prohibition on certain food items or by prohibiting their use on certain religious days (Vosloo, 1988:93) or by combining different foods.

Cultural groups exhibit food practices that are related to their **value systems**. Values determine what is desirable and undesirable as food and which foods are held in high esteem. Values are social products that have been imposed on and slowly internalised by the consumer. Values expressing the relationship of a consumer to various foods serve as a frame of reference to interpret and selectively evaluate new stimuli regarding food (Parraga, 1990:661).

Belief also plays an important role in cultural food choice. Beliefs about food represent an interpretation of the food values and serve as cognitive elements of attitude, although it is important to give attention to the fact that beliefs do not always lead to practice (Parraga, 1990:662). Beliefs about the nutritional quality and health effects of a food may be more important than the nutritional quality and health consequences in determining a person's food (Shepherd & Sparks, 1994:205).

Customs are the standards or norms of behaviour that consumers acquire as members of a social group. Consumers within a culture respond to behavioural pressures by selecting from among the available foods, foods that are acceptable (Parraga, 1990:662). Symbolism refers to the non-rational expressions and meanings that are accepted to be part of food and eating. Every food carries a meaning and these meanings are part of the cultural heritage. The symbolic aspects of food are often of primary importance and a food will be refused if its symbolic significance makes it unacceptable to the consumer. A food can even be craved, sought and dreamed about if its symbolic significance is positive (Parraga, 1990:662).

2.7.7 Socio-economic status

The three variables most frequently used by sociologists, as indicators of socio-economic status are income, education and occupation (Parraga, 1990:226). In addition, according to Roos, Lahelma, Virtanen, Prattala & Pietinen (1998:1521) educational level can be use as an indicator of socio-economic status because education describes the social status and way of life of a person. Employment status can be included (Roos *et al.*, 1998:1521) and divided into five groups: (i) employed, (ii) retired, (iii) unemployed, (iv) housewife/househusband and (v) other non-employed. Under employed both full and part-time employment counts, while a full time student or scholar will be grouped in the other non-employment category. A consumer's income and the price of ingredients directly influence food choice. Consumers with limited income can choose only from the types and amount of foods that they can afford (Smolin & Grosvenor, 2000:11). Consumers adjust their food choices according to changes in prices and to their incomes, which in turn results in changes in their nutrient intake (Huang, 1998:1). "Economic factors dictate whether a person can follow his normal food pattern or must alter them temporarily to meet economic limitations" (Cosper & Wakefield, 1975:152). One of the strongest determinants of the choice of food products is the price of the product (Betts, 1985:75).

2.8 THE CAREGIVER

A caregiver is a person who fulfils the role of caregiving by providing for the needs of a close relative or friend during a period of illness or disability (Hepburn, 1994:1). However, caregiver hasalso been described

as any person looking after another, resulting in the caregiver losing personal freedom (Magaqa, 1999:1). For this study a caregiver was defined as an individual who assumed the responsibilities of caring for and supporting the food-allergic child.

Care giving can be physically tiring and often brings a large emotional burden to a caregiver, who usually has other responsibilities than taking care of the food-allergic child. Neglecting these responsibilities can take a heavy toll on the caregiver's ability to function. The caregiver may also experience feelings of anger, sorrow, frustration and a feeling of being overwhelmed (Magaqa, 1999:2). It is important that caregivers should be educated to use household resources wisely to meet the nutritional, health and psychosocial needs of young children (Kruger, 2001:16).

2.9 RESEARCH METHODOLOGY

This study hinges both on qualitative and quantitative research.

2.9.1 Qualitative research

The choice between different research methods should depend upon what you are trying to find out (Silverman, 2001:25) and will be determined by the units of analysis (Mouton, 2000:51). This is why a dependence on purely quantitative methods may miss the social and cultural construction of the 'variables' which quantitative research seeks to connect (Silverman, 2001:29).

Many agencies who fund research call qualitative researchers 'journalists' or 'soft scientists' whose work is termed unscientific, or only investigative, or completely personal and full of bias. Qualitative researchers still largely feel themselves to be second-class citizens whose work typically evokes doubt, where the 'gold standard' is quantitative research (Silverman, 2001:26). Qualitative researchers always attempt to study human action from the perception of the social actors themselves. The primary goal of studies using the qualitative approach is defined as describing and understanding rather than explaining human behaviour (Babbie & Mouton, 2001:270).

When research is being done, it is difficult when the qualitative research method is used to handle the issues on sampling, validity and reliability (Babbie & Mouton, 2001:274). With qualitative research, there are two types of sampling, the one is criteria development, what the researcher think would be significant in setting the criteria, or theoretical sampling. Theoretical sampling is the process of data collection for generating theory whereby the analyst collects, codes and analyses the data and decides what data to collect next and where to find it, in order to develop the theory (Babbie & Mouton, 2001:287).

One of the biggest points of criticisms on qualitative research is the question on the reliability of the data obtained. Reliability can be defined as the 'degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions' (Silverman, 2001:32).

A second point of criticism of qualitative research relates to how sound the explanations are that are being offered, as far as the validity of the study is concerned. This is sometimes known as the problem of anecdotalism, exposed in the way in which research reports sometimes appeal to a few telling 'examples' of some phenomenon, without any attempt to analyse less clear or contradictory data (Silverman, 2001:34). Rather than reverting to abstract, theoretical constructs, qualitative researchers prefer to use categories and

concepts used by the actors themselves as a further attempt to stay true to the meanings of the participants themselves (Babbie & Mouton, 2001:272). The qualitative researcher prefers to understand events, actions and processes in their context in contrast with the analytical approach of quantitative variable analysis (Babbie & Mouton, 2001:272).

With reliability and validity in the qualitative paradigm, care is given to triangulation, like writing extensive field notes, participant member checks and test trails, etc. to let the participants speak openly. Triangulation refers to the use of multiple methods. It is a strategy in which researchers rise above the personal biases that stem from single methodology. By combining methods and investigators in the same study, observers can partially overcome the deficiencies that flow from one investigator or method (Babbie & Mouton, 2001:275). Triangulation is generally considered one of the best ways to enhance validity and reliability in qualitative research (Babbie & Mouton, 2001:275).

Qualitative research differs from quantitative research in the following ways (Babbie & Mouton, 2001:270): (i) Research is conducted in the natural surroundings of the participants; (ii) It rather focuses on the process than on the result; (iii) The primary aim is achieved through descriptions and understanding of actions and events (iv) The participant's perspective is emphasised; (v) Understanding of the social action in its specific context is important, rather than attempting to generalise to a theoretical population; (vi) The research process is often inductive in its approach, resulting in the generation of new hypotheses and theories. Conceptualising rather than generalising is the outcome; (vii) The researcher is seen as the 'main instrument' in the research procedure.

Qualitative research is not merely an approach to study social processes and actions in their natural settings, but an attempt to view the world through the eyes of the participants. The researcher must try to put himself/herself in the shoes of the participants and feel the situation (Babbie & Mouton, 2002:271).

2.9.1.1 Focus group technique

The focus group technique is an idea-generating strategy leading to a course of action (Delbecq, Van de Ven & Gustafson 1975:32). It is also a free-flowing discussion of selected issues among six to ten people that is led by a trained moderator (Morgan, 1999:71; Casey & Krueger, 1994:77). Smaller groups can also be used if it is apparent that the participants have a lot to say about the issues (Morgan, 1999:73). Silverman (2001:83) says focus groups are where the respondents are offered some topic and then encouraged to discuss it amongst themselves.

The Focus Group Technique (FGT) is an excellent tool to determine participants' desires (Delbecq, *et al.*, 1975:65), since participants usually interact and react to each other's statements (Casey & Krueger, 1994:77). Researchers can also gain in-depth knowledge of how participants think and feel about issues (Borra & Earl, 2000:48). The focus group format allows the moderator to probe for additional information at critical points (Casey & Krueger, 1994: 77). However, in this sense it can be regarded as participatory research, the researcher must remember the data obtained from the FGT is not representative of the large population because a very small number of people are used (Francfurt-Nachmias & Nachmias, 1997:34), although Dr De Wet Schutte argues that it is a projection technique because the participants also talk about other people they know with the same problem, so that a fuller range of individuals are represented (3 December 2001).

Focus groups are a technique used to find information that would not have been accessed in another way. These focus groups are useful because they tend to allow space in which the people can get together and create meaning among themselves, rather than individually (Babbie & Mouton, 2001:292).

Purposive sampling generate the most productive discussion in the focus groups because the goal in focus groups is to gain insight and understanding by in depth discussions (Morgan, 1999:56). It is also very important that the participants must be compatible. They must have some sort of common ground to stand on and be able to talk to each other (Morgan, 1999:56-67).

Deciding on the number of groups is a matter of hearing what there is to hear. If the majority of the people has the same thoughts on a topic, there will be no need for many groups. When the responses are more diverse, it will take more groups to hear what people have to say. The idea that most projects require three or five groups assume that the participants are only moderately diverse and the topic is only moderately complex (Morgan, 1999:77-78).

The location and venue for presenting the focus groups are very important. It must be suitable for the researchers and the participants and should not sidetrack the participants. The layout of the meeting room must also be professional. All the participants must have eye contact with each other. The moderator must also be cautious not to position her-/himself at the head of the table to avoid the impression that he/she is in charge of the conversation (Morgan, 1999:121-124).

The advantage of the FGT is that it is objective and yet provides opportunities to be personal (Delbecq *et al.*, 1975:13). Focus groups have an advantage over other research methods, in that the group dynamics often encourage participants to voice opinions and attitudes that would otherwise be unheard.

The main advantage of focus groups over participant observation is the opportunity to observe a large amount of interaction on a topic in a limited period of time based on the researcher's ability to assemble and direct focus groups. This can also be a disadvantage because it takes place in an unnatural social setting. The comparative advantage of focus group interviews as an interview technique lies in their ability to observe interaction on a topic. Group discussions provide direct evidence about similarities and differences in the participants' opinions and experiences as opposed to reaching such conclusions from post hoc analyses of separate statements from each interviewee.

The technique can be divided into four steps of which the first is planning the focus group. The aim of this step is to anticipate the major decisions that need to be made. Secondly, the participants should be recruited. Problems with recruitment are the single most common reason for things to go wrong in focus groups. Moderating of the group follows this step and care must be taken in ensuring that the moderator must be experienced in handling groups and have a broad picture of the research being done. The last step is the analysis of and reporting on the data obtained (Morgan, 1998:4).

Focus groups are sensitive to inputs and friendship circles, but are not sensitive for the distribution area (Dr De Wet Schutte, Researcher, Personal communication, 6 September 2001), therefore it does not matter where the focus groups are held; the information will be of value to the researcher.

Focus groups can be structured to various degrees. The degree to which a focus group is structured determines the focus of the meeting. When the structure is firm, answers are obtained on specific questions or on a set of topics. When the researcher knows exactly what they want that the more structured approach

is the best choice. By making this decision the researcher claims to know that he is asking the right questions, because highly structured groups will limit the information obtained (Morgan, 1998:46). Less structured groups are most useful for exploratory purposes. By listening to what the participants choose to discuss in a less structured group their perspective on the research topic is revealed. In this situation the focus is on learning as much as possible from the participants. It is difficult to analyse the information obtained because the questions are set broadly. When the main aim is idea generation, this is no problem because no comparison needs to be made between the groups. If, however comparison needs to be made between groups, main topics can be formulated (Morgan, 1999:47). Open-ended interviews and focus groups provide data much more quickly than observations and recordings (Silverman, 2001:160).

2.9.1.2 Case studies

Case studies are usually qualitative in nature and aim to provide an in-depth description of a small number of cases (Mouton, 2001:149). There is still a degree of uncertainty on the value of case studies and its place in research. The study of individual cases has always been the major strategy in advancement of knowledge about human beings. It is only in the last two decades that case study as research method has become "scientifically respectable" (Babbie & Mouton, 2001:280). Case studies are defined by Robson (1994:3) as: "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence." Case studies can be done through questionnaires, structured interviews, in-depth interviews, observation and content analysis (de Vaus, 1994:6). It is important to use multiple methods of investigation when studying cases (Robson, 1994:52, 53,157). This assures a more flexible method of enquiry and hereby a broader picture of the situation is formed. These characteristic of case studies are the greatest strengths of this technique.

Case studies present a procedure or a strategy, rather than a method, such as an interview or observations (Robson, 1994:52). Case studies are an intensive investigation of a single unit. Most case studies involve the examination of multiple variables (Babbie & Mouton, 2001:281).

Mouton (2001:149) describes case studies as ethnographic research that is qualitative in nature and aims to provide an in-depth description of a small number of cases. The type of research question investigated is usually exploratory or descriptive and appropriate applications include the household and family (Mouton, 2001:149). Although no hypotheses are formed there are general ideas or expectations that act to guide the empirical research.

Case studies can be seen as part of participatory research in the sense that the people under observation must help provide data for the research. Health issues are particularly well-suited for the participatory research approach because individuals tend to know more about their own conditions than anyone else and can assist in the diagnosis and treatment of their problems (Collins, 1999:20).

Case studies are empirical in the sense of relying on the collection of evidence about what is going on (Robson, 1994:52). It is not sensitive to distribution area because all the cases will differ from each other anywhere they were to be taken and everyone is treated as a unit on its own. The interaction of the unit within its context is a significant part of the investigation (Babbie & Mouton, 2001:281).

Case studies are not necessarily studies of individuals; they can be done on a group, on an institution, on a neighbourhood, on an innovation, on a decision, on a service or on many other things (Robson, 1994:146).

The development of a research design for a case study differs from study to study, because some designs will have to be very structured while others not. If the study's aim is exploratory then the structure of the study must not be too tight, to get a feeling of the case, while if the main purpose is confirmatory, a fixed pre-structure is necessary (Robson, 1994:148-150). Cases are studied in their own right, not as a sample from a population (Robson, 1994:5).

Cases are selected where, either the theory would suggest that the same result is obtained, or that predictably different results will be obtained (Robson, 1994:162). When sampling is done, it is important to consider the people, settings, events and processes (Robson, 2994:156).

Case studies are best performed when the researcher has some of the following personal qualities: an open and enquiring mind, a good listener, general sensitivity and responsiveness to contradictory evidence (Robson, 1994:162).

When a single investigator performs case studies, the main purpose of the plan is to enhance the dependability or trustworthiness of the study. When a team is used, it is important that all the fieldworkers take on essentially similar roles; everybody must be devoted to the research to the same degree and handle situations in the same way. This is very difficult and can seldom be done. However, when a team is involved it serves to increase reliability by training all fieldworkers to follow the same set of procedures and rules (Robson, 1994:163).

The analysis of the findings of case studies is difficult. Organisation and communication are done after developing clear conceptual categories for the empirical data, which provides a focus for the findings. There must always be records of the communication done in the case study. The discussion of the findings is separate from the presentation of the findings. Research reports must account for the complexity and context of the findings, which is done by presenting the multiple patterns of phenomena and by describing the context and conditions under which the patterns appear. These presentations are characteristic of studies using different methods of data collection of evidence and represent dimensions of broad descriptions (Babbie & Mouton, 2001:283). Generalisations are based on evidence provided by the data. Findings are tested to establish whether they fit in with other knowledge, including direct experience with similar cases, as well as with previous research and theory. Case studies have great potential for theory development.

2.9.2 Quantitative research

Quantitave research is defined as 'research conducted using a range of methods which use measurement to record and investigate aspects aspects of social reality' (Bless & Higson-Smith, 2000:156). In quantitative research the aim is on the quantification of constructs, it relies on measurement to compare analyse different variables (Babbie & Mouton, 2001:49-51; Bless & Higson-Smith, 2000:156). Statistical measures is usually used to determine the results (Babbie & Mouton, 2001:49-51). In this study *FoodFinder ™ 2* were used as a quantitative tool.

2.9.2.1 FoodFinder ™ 2

FoodFinder ™ 2 is a software program designed by the Medical Research Council. A list of ingredients are available on the program. The researcher or developer can developed or insert recipes and or meals to the

program by selecting ingredients and specifying their masses. Analysis are done on clients therefore, age and gender are taken into account. The program analyse the selected recipes or ingredients individually or as a meal, as chosen by the researcher. Selected days can also be analyse. The analysis of the nutrient are divided into seven sections namely, macronutrients, minerals, vitamins, fatty acids and cholesterol, amino acids, other components and energy calculations.

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CHAPTER 3: APPLICATION OF THE FOCUS GROUP TECHNIQUE WITH CAREGIVERS THROUGH WHICH THE NEEDS AND PROBLEMS OF HOUSEHOLDS WITH ALLERGIC CHILDREN ARE ESTABLISHED.

3.1 INTRODUCTION

Literature on the needs and problems of households with allergic children is scant, but the research done by Yadrick and Sneed (1994:1125) and Mandell, Curtis, Gold and Hardie (2002) are particularly relevant. Yadrick and Sneed (1994:1125) studied nutrition managers, district school nutrition directors and district special education directors because they all have physician's diet orders on file. It was established that the specific nutrition condition most commonly reported among school children included food allergy and food intolerance. These researchers also reported the research findings of Robinson (1993), whose findings in a study on schools led him to conclude that the "largest percentage of diets was for diabetes, followed by food allergy". Both Robinson's research (1993) and that of Yadrick and Sneed (1994:1125) substantiated the need for research on allergic children.

Fourth on the list of topics identified by Yadrick and Sneed (1994:1125) as areas that require addressing in educational programs were "understanding the physical and emotional needs of children with special needs". According to Sicherer, Noone & Muñoz-Furlong (2001:461) "families with food-allergic children must live with constant vigilance and fear. The activities of daily life are potentially impacted by issues such as label reading of commercial food products, concerns for cross-contamination of foodstuff in various settings, and exposures that may occur in school, childcare and social activities. These issues presumably affect the quality of life for these children and their families, but these issues had not been well investigated." The research problems that formed the basis for this study were the needs and problems of households with a food-allergic child and their degree of health consciousness.

The following six research hypotheses were formulated: (i) Households with food-allergic children **are health conscious;** (ii) the caregivers of food-allergic children have difficulty **preparing meals for the family**; (iii) children with a food allergy **feel different**; (iv) caregivers of food-allergic children **worry a lot about their allergic children**; (v) caregivers of food-allergic children are **in need of allergen-free recipes**; and (vi) caregivers and food-allergic children **read food labels**.

The following terms are considered relevant to this chapter: (i) **Allergen-free recipes**: Recipes that do not contain proteins that lead to an immune response by the body (Lategan, 1997:6-7); (ii) **Caregiver:** A caregiver is a person who takes the role of providing for the needs of a person during a period of illness or disability (Hepburn, 1994:1), though in this case a food-allergic child; (iii) **Focus group research:** "is a qualitative approach for eliciting the perceptions of a defined population" (Dahlke, Kay, Wolf, Wilson & Brodnik, 200:455); (iv) **Food allergy:** is an abnormal immunological reaction in which case the body's immune system overreacts to ordinarily harmless things (Steinman, 2002); is the immune-mediated state of hypersensitivity that results from exposure to an allergen (Clydesdale, 1996:S187); or is an adverse reaction to foods that involve an immune response (Whitney & Rolfes, 1996:596); (v) **Health:** A state of optimal

physical, mental and social well-being and not merely the absence of disease and infirmity (Dorland's Illustrated Medical Dictionary, 1994:736); (vi) **Health consciousness:** General awareness of issues related to health, determined by salt, sugar, fibre, fat and cholesterol intake and of risks associated with overweight (Girois, Kumanyika, Morabia & Mauger, 2001:1), engaging in health promoting activities (Wanek, Born, Novak & Reime, 1999:2); living up to dietary recommendations (Fagerli & Wandel, 1999:178), awareness of dietary habits, regular eating time, avoidance of salty foods, smoking and drinking habits (Kikuchi, Inoue, Ito, Masuda, Yoshimura & Watanabe, 1999:128), consumption of meatless meals, beans and fruit (Hollis, Carmody, Conner, Fey & Matarazzo, 1986:359), taking of direct, responsible action (Pilz, 1990:236). In the South African concept it would be linked to the Department of Health's South African Prudent Dietary Goals (South African Department of Health, 2002: Annexure 3); (vii) **Healthy:** Pertaining to, characterised by, or promoting health (Dorland's Illustrated Medical Dictionary, 1994:736).

The following operational definitions were formulated:

Whether a household with a food-allergic child was **health conscious:** three specific health-related questions were posed in three focus group meetings, namely: What foods are usually found in your house? Do you think the allergic child eats healthily in spite of his/her food-allergy? Do you consider food groups and balanced meals when you prepare food?

Whether the **meal planning and preparation** were done according to specific procedures, the following four questions were asked in three focus group meetings: When is the decision made on what foods are prepared everyday and who makes the decision? What influences the decision on what will be prepared? How do their meal patterns look and when is the main meal usually eaten? How does the allergic child influence the eating pattern of the household?

Whether the caregivers of the food-allergic children **used or needed recipes**: the following two questions were asked in three focus group meetings, namely: Do you make use of recipes? What problems do you encounter with allergen-free recipes currently available?

Whether having a food allergy had any **social and emotional implications** for the food-allergic child and the parents the following three questions were asked in three focus group meetings, namely: What do you consider worst for the food-allergic child? Do you think food-allergic children feel different? What do you think is the worst for the parents of food-allergic children?

Whether the caregivers of the food-allergic child and also the child himself/herself **read food labels**, the following question was asked at three focus group meetings: Do you read food labels?

3.2 METHODOLOGY

Before the study was conducted ethical permission was requested by completing the relevant forms. Permission was obtained to conduct the research from the Department of Research Development and Support, Faculty of Health Science, Tygerberg Campus, University of Stellenbosch (see Addendum 1).

Focus groups were used as a technique to gather the information of the daily problems and needs of food-allergic children and their households. It is a qualitative research technique of in-depth group interviewing for the purpose of data gathering, with question - focussed discussion as the measuring instrument posed by the moderator. The qualitative interview is flexible and dynamic and has been referred to as non-directive,

unstructured, non-standardised and open-ended (Botha, 2001:13). The focus group meetings aimed to help the researcher form a clear picture of all the influences, factors and problems that are present when confronted with a food-allergic child in a household. Qualitative interviews are particularly suitable for studying people's understanding of their world, for describing their experiences and clarifying or elaborating on their perspectives of their world (Botha, 2001:13, 15; Seidman, 1998:3-4).

The significance of the focus group meetings was to get a broad picture of the situation in households where there are food-allergic children. A spectrum of ideas is placed on the table (Dr De Wet Schutte, Personal communication, November 2001). The data produced by a focus group are the words, phrases and sentences spoken by the participants (Morgan, 1998:56). The final result of a focus group is a written report that summarises the key themes and issues raised by the participants regarding the topic discussed.

3.2.1 Preliminary study

A preliminary study was conducted at The Red Cross Children's Hospital to obviate problems that could arise in the main study and to standardise the procedure. The following four goals were set for the preliminary study. (i) Investigating appropriate methodology, (ii) investigating appropriate sampling techniques, (iii) effectively operationalising the study and (iv) effectively conceptualising the study.

3.2.1.1 Appropriate methodology

It was initially planned to have four focus group meetings, with the caregivers of children allergic to wheat, cow's milk, soy and egg respectively, giving insight into these caregivers' perspectives on their world in the context of their food-allergic child.

After the qualitative research, it was planned to conduct quantitative research (the survey procedure), by having 350 questionnaires completed by the caregivers of allergic children being brought to the hospital for treatment.

The *first research method,* namely the focus group technique was conducted with the caregivers of food-allergic children between the ages of two and eighteen. Only caregivers of children with allergies to wheat, soy, cow's milk or eggs were included in the study.

The researcher held two focus group meetings at The Red Cross Children's Hospital. A moderator was found for the preliminary focus groups. Although she had little experience as a moderator, she had been working in the Allergy Clinic at The Red Cross Children's Hospital for twenty-one years until the end of 2000, and was chosen - as she is considered to be an expert on the topic of allergies and is familiar with the caregivers of food-allergic children at The Red Cross Children's Hospital.

Caregivers of children between the ages of two and eighteen who are allergic to wheat, soy, milk or egg were selected from the database of The Red Cross Children's Hospital for the preliminary focus group meetings.

The two preliminary focus group meetings were held on 3 and 10 September 2001 respectively. Due to bad weather conditions both the focus group meetings held at The Red Cross Children's Hospital had only four participants, a minimum requirement stated by Dahlke, *et al.* (200:455). However, Morgan (1998:73) states that smaller groups can be used if the participants have a lot to say, as was the case.

The *second research method* that was investigated in the preliminary study was the survey procedure using the questionnaire technique. A dendrogram (Addendum 2) was developed with the purpose to set out the theoretical concepts and their relationships for the development of a questionnaire to determine the needs of food-allergic households.

The dendrogram (Addendum 2) had two distinct legs. One leg consisted of the personal information of the allergic child and the other leg contained more of the allergy-free recipe needs of the allergic consumer. The division of certain headings like age, income, education levels and employment status were done according to the South African Advertising Research Foundation's (SAARF) Living Standards Measure (LSM) 1999 classification. LSM is an eight segmented scale used for indicating the socio-economic status of an individual or group.

A questionnaire was developed after a review of available literature and discussions with experts. This helped to establish the type and sequence of the questions. Questions were formulated to answer the elements at the lowest branching levels of the dendrogram (Schutte, 1999:5). After the dendrogram and the questionnaire were completed, the questionnaire was tested on the participants of the two preliminary focus groups. The initial idea was to finalise the questionnaire after this testing phase. The draft questionnaire (Addendum 3) was kept as short as possible to prevent participants from losing interest.

It was planned to have The Red Cross Children's Hospital in Cape Town as venue for the survey, as they have a special Allergy Clinic. Furthermore, it was decided that all the questionnaires were to be filled in by the researcher to ensure its proper completion. The data would then have been coded and the statistical analysis completed.

It soon became evident that the first research method tested during the preliminary study, namely the focus groups required an experienced moderator, as the caregivers became very involved in the discussion and it was difficult at times to give all the participants an equal opportunity to talk. As result an experienced moderator was asked to facilitates the focus group meetings for the main study.

Regarding the second research method tested during the preliminary phase, it became evident that this type of research (Mouton, 2000:152) was inappropriate for the study. Quantitative data would have been gathered with the questionnaire, but apart from the fact that enough subjects could not be found due to possible misdiagnosis, qualitative research would better answer the research question (Babbie & Mouton, 2001:54-55; 274-275). According to Babbie and Mouton (2001:53) "qualitative research always attempts to study human action from the insiders' perspective. The goal of qualitative research is defined as describing and understanding rather than the explanation and prediction of human behaviour." This viewpoint is supported by a study done by Templeton and Van Wyk (1999:75-76) on health-related problems identified and solutions proposed by women in Ivory Park, Midrand for the nursing profession. An example pertaining to qualitative research explained by Frankfurt-Nachmias and Nachmias (1997:280-281) also demonstrated the value of qualitative research where empathetic understanding needs to be developed for the study of human behaviour. Therefore the planned quantitative research method, the survey, was not considered suitable for the main study.

3.2.1.2 Appropriate sampling techniques

According to Morgan (1998:47) focus group participants are carefully recruited based on specific criteria. For this study the study committee decided that the participants had to be between the ages of two and eighteen years, and represented by their caregivers. The allergies investigated were limited to wheat, soy, cow's milk and egg.

The Red Cross Children's Hospital proved to be an unsuitable source for gathering participants as it was difficult to obtain sufficient participants for the main study. The researcher tried to find other hospitals with similar facilities for treating food-allergic children. The Groote Schuur Hospital was also contacted, but they mostly see adults with allergies, with the result that their database of children with food allergies is also limited.

Practitioners of alternative medicine were considered for obtaining participants, but it was decided not to include these professionals, because a gold standard technique, double blind placebo controlled food challenge, was required in the diagnosis of the allergic child prior to the subject being selected for this study.

At the stage that quantitative survey method was considered for the research the choice of an appropriate sampling technique was important. A table was developed (see Table 3.1) with possible sampling techniques that could be used for the survey. Table 3.1 helped to determine the various possible ways in which sampling could be done to ensure the reliability and validity thereof. A meeting was set up with an experienced researcher at the Faculty of Health Sciences, University of Stellenbosch and the study committee to decide on an appropriate sampling technique for the study. The committee decided that it would be best to draw subjects from medical doctors in the Western Cape. This decision was linked to the quantitative research method and the recruiting reported here is not applicable to the main study.

In the process of identifying a suitable database of food-allergic children for the quantitative method initially considered for the main study, it became evident that some dermatologists and other medical doctors considered food-allergies to be unique phenomena. In Stellenbosch two paediatricians were contacted and both responded that they do not have food-allergic children as patients. It appeared that the two dermatologists at The Red Cross Children's Hospital who were approached for their input were also not convinced of the importance of addressing food-allergic reactions. In the preliminary phase of this research there was supporting evidence of the view of Thompson and Chandra (2002:3) that a significant factor contributing to the under-reporting of food anaphylaxis, as well as food allergies, is due to misdiagnosis on the part of physicians.

TABLE 3.1: DIFFERENT SAMPLING TECHNIQUES AND DESCRIPTION OF TECHNIQUE

SAM-PLING METHOD	Saunders, C (1996)	Blaxter, L, Hughes, C, Tight, M (2000)	Bless, C & Higson-Smith, C (2000)	DESCRIPTION
Simple random	✓	✓	✓	Obtain a sampling frame, number each subject in the frame 1,2,3 and so on. Choose some numbers at random (in the range) and include those subjects in the sample whose numbers match those random numbers. This allows every subject an equal chance of being included, thus having a good chance of having a representative sample.
Systematic	✓	✓	✓	The same as simple random sampling, except that the only random sampling taking place is when selecting the first subject from the sampling frame. Every tenth/ twentieth subject is then selected to meet the required sample size and cover the whole sampling frame.
Stratified	✓	✓	✓	It is used when the population is thought to consist of a number of smaller sub-groups, which is thought to have an effect on the data to be collected. Sub-groups are called *strata*. A simple random sample is taken from each stratum separately.
Quota	✓	✓	✓	The same as stratified sampling, but simple randomisation for each strata is not applied. Accept whatever subjects are accessible, as long as they come from the subgroups identified.
Cluster	✓	✓	✓	Splitting the population in sub-groups called clusters with the various characteristics that the population might contain represented in each cluster.
Judge-mental	✓		✓	Subjects are included in the survey in such a way that they are thought to be representative of the population.
Con-venience	✓	✓		Includes those subjects that are immediately at hand.
Voluntary		✓	✓	This sample is self-selected.
Purposive			✓	Handpicking supposedly typical or interesting cases.
Snowball		✓		Building up a sample through informants.
Event		✓		Using routine or special events as the basis for sampling
Time		✓		Recognising the different parts of the day, week or year may be significant.

3.2.1.3 Effectively operationalising the study

In the preliminary focus group meetings only one question was asked, "What are your problems and needs when feeding your allergic child?" They reported their ideas in a round robin way, after which a discussion followed. They had to prioritise their ideas after the discussion (see Addendum 4).

The use of a single question did not prove to be effective. It was difficult to obtain all the information required from a single question and effectively moderate the group, because it was difficult to change the flow of the conversation without asking more questions.

From the preliminary study and literature studied, the researcher identified issues that were relevant and needed further investigation in the main study. These included issues on healthy eating and health consciousness, as well as the procedure for deciding what to prepare and the preparing of the meals for the households, methods of nutritionally balancing meals, *etcetera*. Other areas were the use of recipes and social difficulties of the food-allergic child and its family.

The following questions were identified, namely: Are the members of the household health conscious? Do the caregivers think that the allergic children eat healthily in spite of their allergy problem? Do they use recipes? What problems do they encounter with allergen-free recipes currently available? How does the allergic child influence the eating pattern of the household? These five questions formed the basis for the questions asked in the main study. A flow chart aimed at clarifying the exploratory questions of this research was developed – procedure suggested by Babbie and Mouton (2001:76).

In conclusion the information gained from both these focus group meetings at The Red Cross Children's Hospital (see Addendum 5) were and the review of the literature on research methodology, sampling techniques, *etcetera* were of great value in re-designing the main study.

3.2.2 Main study

The relevant issues that were identified in the preliminary study to be investigated in the main study were the issue on healthy eating and health consciousness, menu planning and the preparation of the meals for the households; the use of recipes; and social/emotional/psychological difficulties for the food-allergic child, as well as for the rest of the family. These concepts and their respective questions used during the focus groups were used to develop a conceptual framework (Franckfurt-Nachmias & Nachmias, 1997:33) to clarify the research (see Figure 3.1).

Figure 3.1 reflects how the theoretical level of Chapter 3 advances into the research level. At the same time it operationalises the main theoretical concepts that were identified in the preliminary study, namely health consciousness, etc.

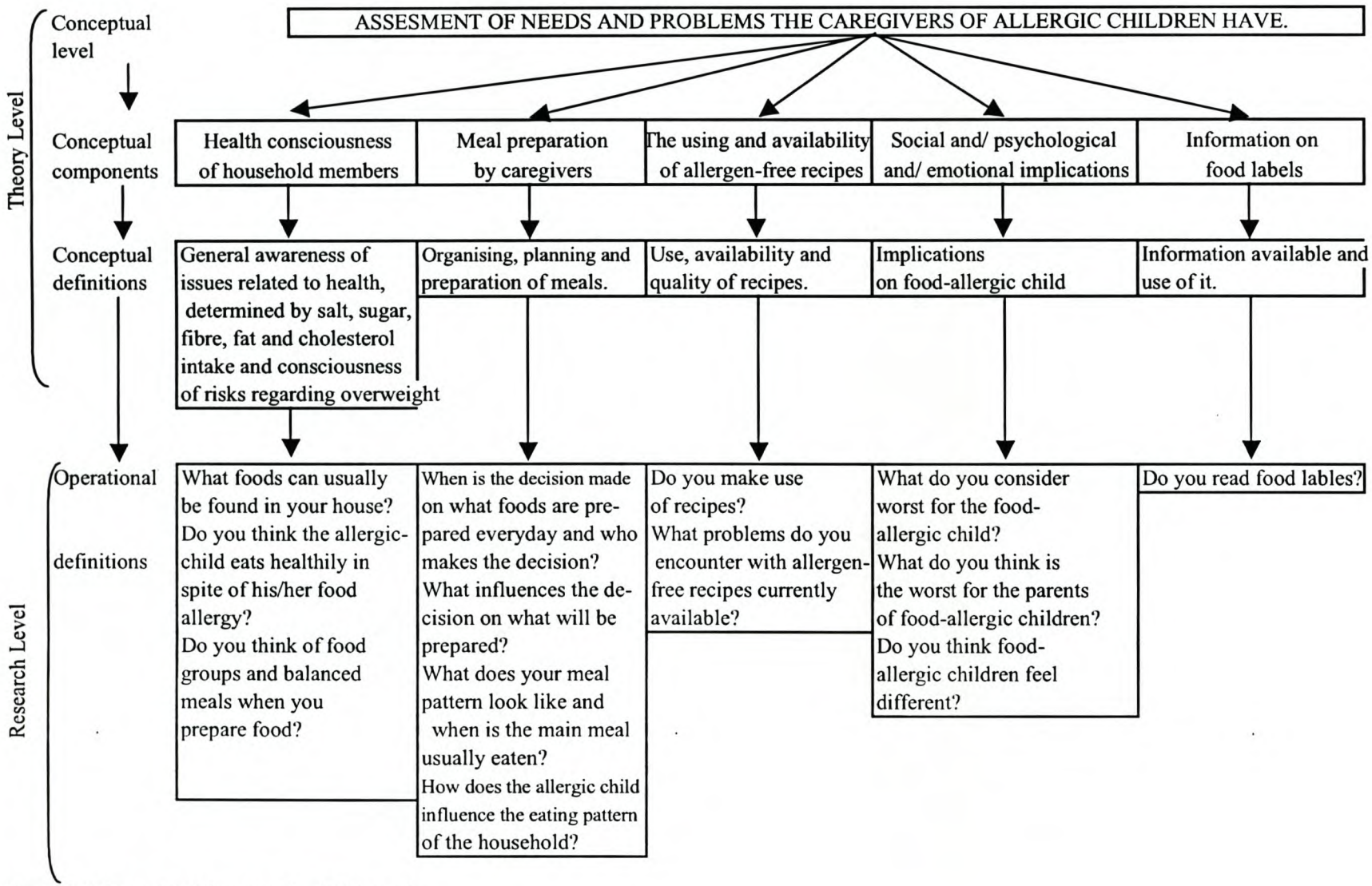

Figure 3.1 Conceptual framework of Chapter 3.

3.2.2.1 Recruiting the participants

After discussion with the study committee it was initially decided to use convenience sampling. A list of contact details for medical doctors in the Cape Peninsula (see Addendum 6), who regularly sent blood samples for food-allergy testing according to an approved confirmatory test was obtained. The doctors were contacted by an experienced fieldworker, first by telephone and then by sending a series of faxes requesting their co-operation (see Addendum 7). Very little was accomplished; no response was elicited after contacting the doctors three to five times.

After this method of finding participants for the focus groups proved unsuccessful it was decided to use the voluntary sampling method. A news article stating the objectives of the research and giving general information (see Addendum 8) was placed in the Stellenbosch Gazette, as well as in the Paarl Post, inviting caregivers to participate in the research. The Helderberg Sun was also contacted, but the researcher had trouble in getting the article published due to excessive cost. Twenty three people responded to the articles. In addition, two Home Economic teachers from Strand and Stellenbosch respectively were asked to appeal to the food-allergic children in their schools to request participation of the caregivers.

On responding to the invitation in the newspapers and via the schools, potential participants were asked specific questions to determine their suitability for the purpose of the study. The two questions asked were:

(i) What is the child allergic to?

(ii) Who diagnosed the child as allergic?

The data derived from each response were summarised (see Table 3.2) to facilitate record keeping and for future contact.

TABLE 3.2: INFORMATION SHEET OF POTENTIAL PARTICIPANTS

Name of the allergic child	
Name of caregiver	
Age of child	
Allergic to:	
Diagnosed by:	
Address	
Telephone number	

Only participants who complied with the specified criteria were included. The criteria were:

(i) The children had to be between the ages of two and eighteen years.

(ii) A medical doctor should have diagnosed the child as food-allergic, a diagnosis by an approved confirmatory test.

(iii) The food-allergic child had to be allergic to at least one of the following foods, namely wheat, cow's milk, soy or egg.

The twenty-three volunteers were regarded as suitable participants and it was decided to have three focus group meetings. Three tentative dates for focus group meetings were selected, namely 5 December (Stellenbosch), 6 December (Paarl) and 11 December 2001 (Stellenbosch). The participants were given a choice of the determined dates and three potential starting times. Once the dates had been communicated to the participants and the time of the meetings finalised, the researcher contacted the participants to confirm the time and date. A day before the appointment all participants were reminded of the meeting, venue and time. Where necessary transport arrangements were made for all participants. By doing this the researcher aimed to counteract possible problems with non-attendance experienced in the preliminary study. Transport was organised for the three meetings and pick-up lists were drawn up.

3.2.2.2 Planning the focus groups

Two focus groups each were held in Stellenbosch, both at the Department of Consumer Science of the University of Stellenbosch, and the third focus group meeting was held at the Dutch Reformed Church in Paarl South, with fewer participants attending in the Paarl area than anticipated. Although, there were only five participants in the Paarl focus group, it turned out to be a very dynamic group.

3.2.2.3 Moderating the group

The questions were not all asked in the same order and the moderator allowed the conversation to flow and asked relevant questions when appropriate. This resulted in the order of reporting the discussions differing and as the focus groups advanced more issues were addressed and more detail could be derived from the meetings (especially the last meeting) (see Addendum 9).

3.2.2.4 Analysis of data

The discussion was analysed by reviewing the important themes. The focus group meetings were recorded with the permission of the participants, and the researcher made notes during all the meetings and the recorded tapes were used as a backup for the notes made during the meetings. Separate reports on the three focus group meetings were developed (see Addendum 9). Thereafter content analysis was applied (Mouton, 2001:167; Frankfort-Nachmias & Nachmias, 1997:292-293). After the three separate reports were written, they were put together as the results of Section 3.4.

3.3 RESULTS AND DISCUSSION

Data pertaining to the participants of the focus group meetings are summarised in Tables 3.3 and 3.4.

TABLE 3.3: GENDER OF THE PARTICIPANTS OF FOCUS GROUP MEETINGS.

	n	Female	Male
Caregivers	23	21	2
Food-allergic children	23	13	10

The 23 participants in the focus groups were two male and twenty one female caregivers. As in the study of Sicherer, Noone and Muñoz-Furlong (2001:462) more women participated in this study than men. There were ten male and thirteen female food-allergic children.

TABLE 3.4: NUMBER OF CHILDREN (N= 23) ALLERGIC TO WHEAT, SOY, COW'S MILK AND EGG OR COMBINATIONS

	Wheat	Cow's milk	Egg	Wheat & milk	Egg & milk	Milk, soy & egg	Wheat, soy, milk & egg
Allergy	1	5	2	5	5	1	4

Of the twenty three participants eight children were allergic to only one food allergen (either wheat, soy, cow's milk or egg). Cow's milk was the single most common allergy. Ten children were allergic to two allergens: wheat and milk (5) and egg and milk (5). There were multiple allergies, namely to milk, soy and egg (1) and to wheat, soy, milk and egg (1).

The various issues were discussed in the three focus group meetings and the results of the data obtained were categorised and are discussed under the main questions asked. As Sicherer, Noone & Muñoz-Furlong (2001:461) states, there is little information available on the problems and needs of the food-allergic child and their families, little reference to other authentic sources are made, due to a lack of information available.

3.3.1.1 Health consciousness

To investigate health consciousness is difficult, because there is no accepted definition of all the concepts that are to be incorporated in the term 'health conscious'. From the questions below, certain conclusions could be drawn regarding health consciousness, though this represents a limited understanding of health consciousness.

What foods can usually be found in your house?

The participants reported that the following were found to be in most of the participants homes: milk, bread, cake flour, fruit and vegetables, breakfast cereals, eggs, cold meat, butter or oil, salt and pepper, spices, sugar, cooldrinks, coffee, tea, tomato mixes, tuna, pasta, baking powder, mayonnaise, chutney, jams, marmite, cheese and cocoa.

No indication of special dietary requirements was evident from the list of foods identified in the households nor was there a clear indication of accommodating the allergic child. This led the researcher to believe that

the allergic children's dietary requirements were often neglected. No "treats" for either the allergic and other non-allergic children were mentioned.

The ingredients found in the households were "everyday day" food for a "normal" house. Therefore, when the recipes of the two-week menu cycles were to be compiled, care should be taken that the ingredients in the recipes were food usually found in the house. Sloan (1999:42) states that one of the top ten current trends among consumers is to simplify their lives. Where food preparation was concerned they demanded a simple supper. Consumers are moving to preparing one dish that is not time-consuming and has 'simple' ingredients. Ingredients specified in the selected recipes also had to be readily available and limited in number.

Are the members of the household health conscious?

The majority of the participants indicated a tendency towards varying degrees of health consciousness, but very few reported being predominantly so. It was also difficult for the participants to fully understand what was meant with the terms *healthy* and *health consciousness*. It was very obvious that the knowledge of the participants on nutrition was limited, a finding supported by Hollis, Carmody, Connor, Fey and Matarazzo (1986:360) in numerous studies that suggest nutritional attitudes, age and personality characteristics to be more frequently and more strongly related to actual eating behaviours than knowledge on nutrition.

Members of the same household differed in degree of health consciousness. The older participants appeared to be more health conscious. The caregivers from higher socio-economic groups were more health conscious than those from the lower socio-economic groups. The majority of the participants indicated that their health consciousness was reflected by the limited amount of fats in the diet (which corresponds with Girois, Kumanyika, Morabia and Mauger (2001:1), as well as the preparation methods (also noted by Pilz, 1990:236) and amount of vegetables included in the diet (mentioned by Hollis, Carmody, Conner, Fey & Matarazzo, 1986:359). One participant commented on food groups and the colour and texture of the food on a plate using these two concepts to illustrate the application of health consciousness in this particular household. The latter household was probably an exception. Due to the participants' lack of nutrition knowledge it is very difficult for them to manage conditions like food allergies, diabetes or even the boosting of the immune system. The majority of participants tried to live according to their knowledge of health principles or as best as their life style allows them to. Another fact that should be acknowledge here is the statement made by Armitstead (1998:95) that few consumers were comfortable to admit to giving their family that which is supposedly bad for them.

The researcher noted that the socio-economic status of the participants affected their degree of health consciousness. Nine of the twenty three caregivers were from the middle to higher socio-economic level, according to the LSM. The participants from the higher socio-economic level were more health conscious. This could be due to higher exposure, better availability of resources and improved buying power of people from the higher income group (Armitstead, 1998:98). This finding contradicts Gould (1990:232) who stated that highly educated people are too busy or varied in their daily activities to consider themselves high self-monitors of their health-status or to be very involved with their health.

Do you think the allergic child eats healthily in spite of their food allergy?

The caregivers responded unanimously that the children ate healthily when they were babies, but that eating became more problematic as they grew older. The caregivers were more concerned to ensure that, as toddlers, these children ate something, than they were concerned about what they ate. After four years of age, the focus shifted from amount of food consumed by food-allergic children, to a healthy eating pattern for these children. The children became selective of what they wanted to eat. It is apparent that the stages in the life cycle play a role, because when these children become teenagers their eating habits deteriorate again or deteriorate further and their diets become mostly unbalanced.

The caregivers admitted to having a limited knowledge of what "healthy" entails, so that they were not in a favourable position to evaluate the eating habits of the children. Traditional potato chips is a food most allergic children tolerate and is given as a treat. Most of the caregivers reported that they often fall back onto this food item when they run out of ideas or when they are eating out. All the caregivers agreed that there was much room for improvement in the area of healthy eating.

Some of the caregivers reported to giving the children a form of supplementation to boost the immune system (e.g. *Propelus Kid*), but most of them only supplemented some of the essential vitamins (e.g. multi-vitamins) and minerals (e.g. iron).

The results suggested that it is difficult for these caregivers to meet the children's nutritional needs. The participants reported that their allergic children have the same preference and dislikes of "normal children" and this, combined with the food allergy, makes it difficult to form balanced eating habits which will contribute to their nutritional, social and preference needs. Care must be taken that these children do not over consume the same type of food. They should consume small amounts of other important foods. According to Vitamin Information Centre (2001:1) "poor dietary intake and nutritional status [of the children surveyed (SM)] is of great concern because of their known adverse impact on the physical and mental development of the child, as well as the loss of individual achievement, poor quality of life and significant adverse effects on social and economic development at the national level".

The focus group discussion showed that the caregivers try their best, although they are in need of help.

Do you think of food groups and balanced meals when you prepare food?

The majority of the caregivers have some recollection of food groups, but they do not really know the specifics nor can they apply the knowledge. One participant mentioned that he paid attention to colour and texture of the different foods on the plate. Others mentioned that a meal was seen as balanced when there were both vegetables and meat on the plate. Quinn, Leung and Wanitprapha (1995:5) found that the main factor in food choice for working mothers was to avoid hassles by serving their children's food preferences. This correlates to the current consumer trends reported by Sloan (1999:42) that time and convenience of food preparation is very important. The caregivers usually cook spontaneously and the taste of the food is the most important component of a meal. Other factors influencing food choice (see Chapter 2, Section 2.7), apart from preference, include availability, convenience, family life style, health consciousness, cultural influences and sociol-economic status. In the discussion it became clear that convenience and availability were strong drives for the food choice of most of the households, and not the nutritional concepts such as food groups or other nutritional guides.

There are at least four general goals related to meals. The first goal is good nutrition, the second that meals should not cost too much, and should stay within the planned budget for food. The third goal is that the meals should be the kind the family would want to eat, while the last goal is to fit the responsibility for meal planning and preparation into planned use of time, energy and other resources (Kinder & Green, 1978:6-7). From these results it is clear that only two of the main objectives of meal planning, namely that it should suit the household's food preference and that the meal preparation must fit into the available time and resources, are considered.

The researcher identified the need for the development of a two-week menu cycle to be used as resource by the caregivers for meal planning and preparation. The selected recipes should take their needs in consideration, namely, time and available ingredients and food preference and nutritional adequacy. For the last consideration the caregivers seemed ill-equipped and here they required the most help. This corresponds to the findings of Yadrick and Sneed (1994:1126).

3.3.1.2 Meal planning and preparation

Four questions were asked to determine the process of food planning and preparation in the households.

When is the decision made on what foods are prepared everyday and who makes the decision?

The caregivers reported that the female head of the household decides on the foods to prepare for the meals. If the male head of the household did not work, but the wife did, he would often prepare the meal. She, however, remains responsible for deciding what to serve at the meal. The participants identified five different approaches to the decision-making process:

- The decision on what to prepare was made during the course of the day.

- Specific foods were prepared on specific days of the week. In the case of the Coloured participants fish was found to be eaten on Mondays, mince meat on Wednesdays and sausage on Fridays.

- In the beginning of the week the week's menu was informally finalised and the shopping done accordingly.

- Just before the preparation of a meal, available food in the house dictated what would be prepared.

- All the non-perishable foods were bought at the beginning of the month, and only perishable foods were bought as required. In this case any of the above approaches could be used to make a specific day's food choice.

In all the scenarios stated, it is clear that the decision-making does not follow a specific pattern and that it was quite possible to change the menu on short notice.

As the mothers decided on the foods to be prepared any educational programs formulated should be aimed at the mother, whether she is the caregiver or not. This finding is supported by other research findings on the empowerment of households.

It became clear that merely compiling recipes for the allergic child would not be enough to address the real issue of diets that are nutritionally inadequate. Furthermore, the food available in the house has a large influence on the decision of what food to prepare. Food decisions made by consumers affect the nutritional quality of their food intake and are influenced by *inter alia* cultural, and psychological factors and life style, as well as food trends, which serve as barriers to selecting foods for healthful diets (Asp, 1999:287-288).

The inability of caregivers to plan nutritionally adequate meals over a period of time needed to be addressed. Therefore, the compilation of appropriate allergen-free recipes became a secondary need of the participants, especially in view of this overriding need to develop a balanced two-week menu cycle, which was the preliminary focus of the research reported.

If **only** allergy-free recipes were to be given to the caregivers, it would still have no effect on their menu planning and thus the researcher planned to develop four two-week menu cycles (see Chapter 5) and evaluate its nutritional adequacy (see Chapter 6).

What influenced the decision on what would be prepared?

All the participants reported that they firstly prepared food to the preference of the household and considered taste being most important. They also looked at the time the dish would take to prepare, ingredients available and the household budget. Literature strongly emphasises the importance that the consumer attaches to taste and preference (Quinn, Leung & Wanitprapha, 1995:9; Asp, 1999:289; Armitstead, 1998:98).

How does their meal pattern look and when is the main meal usually eaten?

Most of the participants said that they eat their main meals in the evening when everyone is home from work and after the school's activities. The time ranges between 18h00 and 20h00. One participant said that her family enjoys their main meal in the afternoon, as her husband comes home for meals. She dishes up plates of food for the children. By doing this she prevents her children from snacking continuously during the afternoon. Most of the participants stated that they eat three main meals a day, and that the children usually snack in the late afternoon. Usually it was on a slice of bread with cheese and, if allowed, a treat.

With the exception of the one household reported on, all the others enjoy the main meal in the evening. When the two-week menu cycles are reported it should be noted that the main meal will be developed for supper, but the households would be able to exchange lunch and supper, as they wish. This decision also helped the researcher to determine when to go for her unannounced visits to the case-study households to observe their eating habits.

How does the allergic child influence the eating pattern of the household?

This issue is controversial. Some caregivers reported that their households adapt to the pattern of the allergic child, while in other households the allergic child adapted to the eating pattern of the household. In most of the households the same type of food was prepared, but the allergic child's food is prepared without the allergen. Most often the other non-allergic children in the household were also denied the "nice" food that the allergic child could not have. In other cases, the allergic child was denied the treats that all the other children were allowed. Whichever scenario prevailed, it was clear that it was to the psychological disadvantage of the allergic child to be treated differently from the other children in the household, and that this put restraints on the households, a view stressed by Stevens and Stoner (1979:15).

There seems to be general agreement that food preparation would be a lot easier if special provision had not been required for the allergic child. The allergic child definitely has an effect on the household's eating pattern; it either places stress on the household or makes eating a big issue. The recipes to be compiled need to consider these aspects. The adapted recipes should also be suitable for every member of the household.

3.3.1.3 Recipe use and needs

Two questions were asked to investigate the role that recipes play in household and the problems they encountered with recipes in general.

Do they make use of recipes?

The caregivers from the higher socio-economic groups were more likely to have recipe books, but seldom made use of them. Ideas were sometimes generated from them or they were used for the preparation of meals for special occasions. According to the majority of the participants recipes require too many ingredients and the ingredients were not commonly available in their households. They also added that it took too much time to prepare dishes from recipes. Most of the participants felt that the members of their households required "normal" food for their meals. Recipe books were considered a resource from which to generate ideas or for baking cakes.

From the above responses, the researcher was made aware of the necessity for the use of common, everyday ingredients in the selected recipes and for favouring simple procedures.

What problems do you encounter with allergen-free recipes currently available?

Ingredients found in allergy-free recipe books are not commonly available in households, which makes it difficult to prepare the recipes. These allergen-free ingredients were not available in the stores where caregivers do their daily shopping and the caregivers must make an effort to locate and buy them. Sometimes they forgot to purchase the particular ingredient - not being an everyday product. They were also expensive. Many households have a limited budget for food, and money must be used most effectively - an important issue for consumers (Quinn, Leung & Wanitprapha, 1995:3; Armitstead, 1998:98).

It was apparent that allergen-free recipes were not readily available to the participants and that information on food allergies not easily obtainable. The caregivers reported learning by trial and error. These allergen-free recipes that were available were regarded as being too complicated for everyday use - requiring too many ingredients and the method of preparation too complicated and time consuming. Additionally the caregivers reported that the recipes were not appetising. Allergen-free recipes were considered to be bland and tasteless. The researcher concluded that the participants required allergy-free recipes that were appetising, easy to prepare and not too time consuming, consisting of ingredients that are commonly found in their homes.

3.3.1.4 Social and emotional impact of food allergy on a household

Three questions were asked to investigate the social and emotional impact of having a food allergy in a household.

What do the caregivers consider worst for the food-allergic children?

There were a variety of issues that the caregivers pointed out. The most prominent one was the symptoms of allergies, like eczema, itching, swelling and diarrhoea. Mostly the worst symptoms were identified to be those that negatively affected the child's appearance. A further problem was the restriction of food that they were allowed to consume. Just like all other children the allergic child sometimes craved specific food. Experience has shown that they usually craved the food they were not allowed to have.

The social implications of not being allowed to eat all the food available at a social function were also considered a major problem. The children often feel a bit odd or out of place, because the eating requirements prevent them from normal social interaction, and they always have to make enquiries about the ingredients in the food being served to them. When it comes to the foods that they are offered these children are treated differently, and by constantly having to explain their condition, emphasis is placed on their special needs and difference (Willingham, 2000:108-109). Especially in the case of a more introverted child this can be very uncomfortable, and may lead to the child avoiding social interaction (Craig, 1996:396).

Some of the participants reported the children to have a real fear of doctors and hospitals, as they had to spend an enormous amount of time at hospitals, and associate them with feeling sick and undergoing treatment. Feelings of guilt and being a burden to the rest of the household were identified as a problem in two of the households represented by the caregivers. The children are sensitive to the extra time and trouble involved in preparing their meals. According to Craig (1996:93-94) the way parents handle a situation has a big impact on the way the child experiences the situation and he suggests that parents should not make a big issue of the situation.

Never being able to eat something spontaneously, and incessantly having to search for allergens in food is a problem. They constantly have to evaluate whether they are allowed to eat foods, and have to exercise the discipline to refuse foods that they should not be eating. This is especially a problem when the child goes to other peoples' houses and are still too young to take responsibility for his/her own eating habits. Reading food labels by the caregiver and the allergic child was also mentioned in the context of extra care. This dependence on label reading is stressed by Joshi, Mofidi and Sicherer (2002) who also noted that "most parents were unable to identify common allergic food ingredients" on the ingredient labels of commercial products due to complex ingredients terminology. In the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2002) (see Annexure 8) reference is made to "hidden allergens". In view of the findings in Joshi *et al.* (2002) they certainly appear to be just this. Obviously this also contributes to aggravating the problems experienced by allergic children and their households (see Section 7.3.3).

From the problems experienced by the allergic children it is clear that the allergic children face many restrictions and are confronted with numerous daily challenges, findings supported by Sicherer, Noone and Muñoz-Furlong (2001:463). It is difficult to help the child cope with these everyday problems.

Sicherer, Noone and Muñoz-Furlong (2001:461-462) said childhood food allergy has a significant impact on the ability to get along with others. They also reported behavioural problems, including aggression, delinquency, impulsivity and social withdrawal. Food allergy puts limitations on physical activities like walking and sports practice as well as family activities which "may become limited or interrupted" (Sicherer, Noone and Muñoz-Furlong, 2001:462). This leads to family tension as a result of the child's health.

What do the caregivers think are the worst for the parents of allergic children?

The main issue centres on the fact that the child feels embarrassed of him/herself. Parents feel sorry for the suffering that the children are subjected to, and sympathise with their children's misfortune. For instance, if a child has a skin condition, the allergic child sometimes feels shy, and the parents sorry. The emotional impact that the food allergy has on the parents was also reported in the study done by Sicherer, Noone and Muñoz-Furlong (2001:462).

The caregivers also reported constant family fights about food, due to parents having different views on how to approach the problem in a particular household. Most often one parent is very strict, while the other considers the allergy to be less important, and would ignore it if the child consumes forbidden foods. The children also sometimes get irritated with the situation and fight and throw tantrums when they are not allowed to have a specific type of food.

All the respondents stated that they always worry when visiting family or friends or when eating out. When going to a restaurant there is no guarantee that the food would not contain some allergen that the child is allergic to. However Willingham (2000:123), who regards this as part of the process of educating the child supports the practice of eating out in a restaurant (see Section 7.2). Also when going to friends the child may consume something without knowing that it contains the forbidden allergen. Restricting children from eating things that they want is often hard for the parents. The caregivers said that they felt cruel in these situations. The children will never have the pleasure of eating spontaneously, because they will also have to be on the lookout for allergens or hidden allergens. Willingham (2000:123) wrote a book on experiences people had with food-allergic children and she says, "Most families find a way to continue eating out together. And realistically, it's a good idea to do so at least occasionally. If your goal is to normalise your child as far as possible, that's going to have to include eating away from home. Like everything else, the key to eating out successfully is to educate yourself about restaurants you plan to patronise."

The caregivers reported that as parents they are concerned about their children's health. Most of these children have difficulty obtaining all the nutrients that are necessary for a healthy body, and thus poses a concern for the parents. They also do not know whether the children will outgrow the allergy and if it will have an effect on other areas of the children's health because it affects the immune system. According to the findings of the research of Sicherer, Noone and Muñoz-Furlong (2001:462) food allergy has a significant impact on the general health of children. There are also the financial implications of having to pay high medical bills. Allergic children are more vulnerable to diseases and, due to their lower immunity (Taylor, Hefle & Muñoz-Furlong, 1999:16), have to visit the doctor more regularly.

Only one caregiver mentioned the issue of food preparation. It is apparent that the issue of food preparation is apparently not the biggest issue for parents with food-allergic children. They struggle with food preparation in the beginning, after diagnosis, and then learn by trial and error.

From the responses the researcher became more aware of the stress the parents of the allergic child experience, and their concerns for their children's well being. According to the caregivers, families with food-allergic children must "live with constant watchfulness and fear" (Sicherer, Noone & Muñoz-Furlong 2001:461).

The researcher noted a contradiction in the fact that they mentioned the children's low immunity and that they are worried about their health, yet they are not sure of the basic principles of healthy eating, nor are these parents equipped to identify hidden allergens in commercial foods.

Do you think food-allergic children feel different?

The caregivers all stated that in certain situations the food-allergic children do feel different, but many said it was not necessarily troublesome. Other caregivers said it definitely had an affect on their children. Willingham (2000:101), who also observed this phenomenon said the manner in which the parents handle

and teach the child about the food-allergy has a great influence on his/her feeling different or not. Sicherer, Noone and Muñoz-Furlong (2001:461) stated that very little research has been done on physical and psychosocial functioning of the allergic child

What tips would they give other parents of food-allergic children?

Most of the caregivers suggested that households with a food-allergic child should avoid the foods that the allergic child is not allowed to eat. The food must be omitted totally in the household to prevent any fights or discomforts. One mother also said that you must not look at what they may not eat; rather look at what they may eat. Be positive about the situation, because you will make it a bigger problem to yourself and the allergic child, by being negative. This approach was also addressed by Stevens and Stoner (1979:15-16). Accept the allergy, and keep the child optimistic, do not make a fuss about the whole thing but treat the allergic child just like the other children. Try to accommodate the child by trying to fit into his pattern. Be sensitive to the allergic child's needs.

Listen and talk to people with the same type of problem, it will help seeing the situation in perspective and helpful tips can be given and received. Another caregiver said she always tried to fix the symptoms in the beginning, but that you should rather try to prevent them from occurring and try to look for the source of the problems. Seek the cause of the allergy and stay away from that. One woman stated that other people are mostly totally uninformed on food allergies, but that you must tell everybody that your child is food-allergic. Most often people are willing to help.

Propelus Kid is a homeopathic remedy that works against allergic reactions and increases the immunity of the child. It is a supplement that can be use by all children to boost immunity. The use of an iron supplement is also a good idea for any food-allergic child. McKenzie, Dixon, Smiciklas-Wright, Mitchell, Shannon and Tershakovec (1996:868) support this advice. Cream for skin conditions, usually with cortisone, makes the children's skin thin, and should be avoided.

Do not take your allergic child along when going shopping, because they will see the food they are not allowed to have nor to a coffee shop, they feel 'out' and there is nothing for them there. Pack a nice lunch box for the allergic child to take to school, so that when the other children have a treat there, he/she will have something as well and not feel like a misfit.

3.3.1.5 Label reading

A question was asked to determine if having a food-allergic child in the house has an effect on label reading.

Do the caregivers read the labels of products?

Most of them read product labels. Some of them only read the labels of foods with potential danger, but mostly they read labels and try to teach the allergic child to read labels as well. Sicherer, Noone and Muñoz-Furlong (2001:461) also stated that it became a daily food habit to read labels on commercial products. However, they were sometimes misled or uninformed about the terminology used on the labels (see Section 7.3.3). This is consistent with the findings of the study by Joshi, Mofidi, Sciherer (2002:1027). This can lead to unidentified hidden allergens. It is imperative that the draft legislation for the labelling and advertising of foodstuffs must be promulgated as soon as possible so that problems pertaining to hidden allergens in commercial foods can be addressed. Having noted this the researcher decided to hand a copy of the hidden

allergens according to the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2002) (see Annexure 8) to all the participants who attended a further meeting. However, this information remained sophisticated (see Section 7.3.3).

3.4 CONCLUSIONS

The following conclusions were made from the results:

3.4.1 Health consciousness

Households with allergic children are not health conscious, though some try to be. They see a meal as balanced when there are both vegetables and meat on the plate and fruit was included in the daily meal plan. It appears as if food preference is the element suppressing healthy eating. The participants did not make use of any nutritional information, so there is a strong possibility that the allergic children have a low nutritional status as was also found in the national survey (Vitamin Information Centre, 2000). There seems to be a need to educate consumers on healthy eating and nutritional concepts.

A contradiction was noted when they mentioned that the children have a low immunity and they worried about their health, yet they are not sure about the basic principles of healthy eating. They had little knowledge on the issue of food groups and other guides to healthy, balanced eating.

3.4.2 Meal planning and preparation

The preparation of meals, directly after diagnosis on the particular food allergy, was difficult for the caregivers. They have difficulty compiling meals that everybody can eat, while also catering for the allergic child. They had to learn to handle the food preparation by trial-and-error.

3.4.3 Recipe use and needs

It appears as if a very small number of participants have recipe books and use them. They feel the recipes have too many ingredients, are too complicated and time consuming. It also appears as if they contain ingredients that are not readily available in their homes.

3.4.4 Social/ emotional/ psychological impact of food allergies in a household

Some of the children experience social restrictions like being reluctant to socialise, shyness and feelings of being different. Some children felt that they were a burden to their households.

The emotional implications that the food allergy has on both the allergic child and the caregivers are noticeable. The caregivers feel pity towards their children and they are constantly afraid for their health and social skills. They have practical problems when the allergic children go to visit friends or family and they dislike the restrictions put on the children when eating. Eating out is also a problem and has implications on compliance. The allergic children largely dislike their symptoms and that they constantly have to notice what they are allowed to eat. They want to eat what they want and like.

3.4.5 Label reading

The allergic child and caregiver both read food labels, although they do not always understand all the terms and not all products contain food labels.

3.5 RECOMMENDATIONS

The researcher recommends that more educational programs should be developed for the food-allergic household's members to help them handle and cope with the situation. This recommendation is reflected by a statement made by Scrimshaw (1990:88): "Every country needs more than recommended dietary allowance or quantitative nutritional goals. It requires practical guidelines that help individuals to choose available and affordable foods that are consistent with their dietary preference and that promote their good health and that of their families." It became very clear that participants needed help with planning and organising meals and menus. Therefore, the researcher planned to develop (see Chapter 5) two-week menu cycles to serve as an education tool for healthy eating, rather than just developing or compiling allergen-free recipes (an approach originally planned).

It can be concluded that the focus group meetings were a success in obtaining information about the allergic child and its position in the household. Because the researcher required further in-depth information on the daily lives of these children and their households, the researcher decided to choose seven participants from the focus groups and use them for the case studies.

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CHAPTER 4: USING THE CASE STUDY TECHNIQUE TO UNDERSTAND AND DESCRIBE THE SOCIAL AND PHYSICAL HOUSEHOLD ENVIRONMENT OF THE ALLERGIC CHILD AND THEIR ALLERGY ASSOCIATED NEEDS.

4.1 INTRODUCTION

The focus groups that were conducted indicated that there was a need for more in-depth information on the social and physical environment in which allergic children function. The attitudes of all the family members, the daily routine of the household, the personal problems and worries as well as solutions to the adjustment of having a child with a food allergy in the household, were all topics that were commented upon in the focus groups, but not clarified enough to get a in-depth picture of behavioural patterns of the household members during food preparation.

There is not much literature available on the daily needs and attitudes of the food-allergic child (Sicherer, Noone & Muñoz-Furlong, 2001:461). In fact, during an extensive literature search not much information could be found on allergic children and their households' needs. The research articles by Sicherer, Noone and Muñoz-Furlong (2001:461-464); Clarke, McQueen, Samild and Swain (1996:89-98); and Mandell, Curtis, Gold and Hardie (2002:95) proved useful in the context of this particular area of research (the allergic child and their household needs). However, not much was found concerning specifically recipe needs. In research conducted by Yadrick and Sneed (1994:112-1129) on special needs of children, they looked at the issues relevant to food-allergic children, but reference to recipes was also limited.

In a study on the impact of childhood food allergy on quality of life Sicherer, Noone and Muñoz-Furlong (2001:461) made the comment that "(t)he activities of daily life are potentially impacted by issues such as label reading..., concerns for cross-contamination..., exposures..., but (these issues) and their impact on quality of life (have) not been well investigated.

This study therefore aims at investigating the allergic child's social and physical household environment in order to throw more light on the recipe problems and needs of food-allergic children and their households. In this way other issues not investigated by Sicherer *et al.* (2001) may be exposed, contributing to alleviation of problems within these households.

4.2 METHODOLOGY

The focus groups helped to formulate a broader picture of what happens in households with food-allergic children, but case studies were considered to determine the everyday needs, problems and attitudes of the allergic child's daily environment. With the help of the case study research technique the perspectives of all family members were investigated and a general impression gained on the households. Case studies are inductive and no hypotheses are formulated, "general ideas" or "expectations" act to guide the empirical research (Mouton, 2000:150).

According to Babbie and Mouton (2001:275), the researcher must take great care with triangulation in order to enhance the validity and reliability of the study. Triangulation is the application of multiple research methods as a plan of action to improve on the problems stemming in qualitative research from the use of a single research method. By combining more than one method in the same study, observers can partially overcome the deficiencies that come from one method (Babbie & Mouton, 2001:275). For this reason it was decided to complement the focus group technique with case studies.

The following research methodological terms are considered relevant in this chapter, namely case studies, content analysis, field research and probing. **Case studies** are usually qualitative in nature and aim to provide an in-depth description of a small number of cases (Mouton, 2001:149), involving observations of a single group or event at a single point in time (Frankfort-Nachmias & Nachmias, 1997:146); **Content analysis** is the analysis of the content of texts or documents. "Content" refers to words, meaning, pictures, symbols, themes or any message that can be communicated (Mouton, 2000:165), any technique for making inferences by systematically and objectively identifying specified characteristics of messages (Frankfort-Nachmias & Nachmias, 1997:324); **Field research** is the study of people acting in the natural courses of their daily lives (Frankfort-Nachmias & Nachmias, 1997:281); **Probing** is a technique used by the interviewer during the case studies to stimulate discussion and obtain more information (Frankfort-Nachmias & Nachmias, 1991:243).

4.2.1 Preliminary study

The procedure followed to conduct the case studies can be divided into six main categories, namely (i) ascertaining criteria for the selection of appropriate case studies, (ii) selection of appropriate case studies, (iii) development of a measuring instrument, (iv) standardisation of the technique for interviewing, (v) planning a time schedule for the various interviews of units and (vi) development of a template. Each step will be discussed separately.

4.2.1.1 Ascertaining criteria for the selection of appropriate case studies

From the total number of participants (23) seven case studies had to be chosen. A set of criteria was developed to choose the cases: the caregiver should have been enthusiastic about the study at the focus group meeting; the household should have come from the middle-income class (groups 4-6) using the South African Advertising Research Foundation's (SAARF) Living Standards Measure (LSM) 1999 classification; some of the caregivers should have appeared to have the allergic condition under control, while others would benefit by guidance; at least one of the caregivers should not have been the allergic child's mother; selected food-allergic children were to have been of different ages and both genders; and the households should be in a reasonably safe environment, so that the safety of the researcher would not have been jeopardised.

4.2.1.2 Selection of appropriate case studies

The case study criteria was developed after the focus group meetings were completed so that the information obtained from the focus group meetings could be used in selecting appropriate participants.

The following seven participants (see Table 4.1) were selected on the basis of these criteria.

TABLE 4.1: SELECTED PARTICIPANTS FOR CASE STUDY STUDIES

Caregiver	Gender of allergic child	Age of child	Allergic to:
1. Mother	Boy	6	cow's milk
2. Mother	Girl	6	cow's milk, maize
3. Grandmother	Girl	8	cow's milk, fish, egg
4. Mother	Girl	13	egg, soy, maize, peanut
5. Mother	Boy	12	cow's milk
6. Father	Girl	8	wheat
7. Mother	Boy	7	Egg, nut

It was decided that if the researcher found contradictory or incomplete data for any of the cases, more cases would be selected. This was not required. While conducting the interview, the researcher also observed the situation, relationships and non-verbal communication, a procedure recommended by de Vaus (1994:42).

4.2.1.3 Development of a measuring instrument

The different units (Mouton, 2001:51-52) that needed to be investigated were firstly identified. The five units of investigation were the following: (i) the caregiver, (ii) the allergic child, (iii) other children, (iv) "non-caregiver parent" and (v) the household. Four questions were asked to the caregiver in the beginning, to gain background information on the allergic child. The six questions on the aspects of the household were addressed by interviewing the caregivers. In the case where the grandmother was the caregiver, the allergic child's mother was interviewed as the unit "non-caregiver parent". The question asked on the food in the house on a specific day, were categorised under the groups of the USDA Food Guide Pyramid groups and two additional groups were added, namely 'processed food' and 'other'. The unannounced visit at the main meal was regarded as part of the unit pertaining to the household.

The set of question units that arose from the first case study was incorporated in the questionnaires of all the other cases. Figure 4.1 was developed to order the units of analysis.

4.2.1.4 Standardisation of the technique for interviewing

The researcher interviewed the caregiver, thereafter the allergic child. After interviewing the allergic child, the other children and then the other non-caregiver parent were interviewed. The reason for approaching the caregiver first was to get the household comfortable with the idea of an unknown person in the house, as the caregiver already knew the researcher from the focus group meetings - so it was easier to get acquainted with the whole family through the caregiver.

During the preliminary study the researcher discovered that the question could be asked, and followed by a period to allow for a reply. If no reply followed, the researcher again assured the respondent that there was

no right or wrong answer. The researcher would then repeat the question. If there was still no reply, the researcher would probe further.

Probing was done by asking more questions on the same topic but not leading the interviewees to possible answers. These extra questions were asked out of experience from previous case study participants - a procedure Mouton (2000:150) also supports. During probing the researcher was very alert to body language and other signals from the interviewees. Mostly, at the start of probing, they began to talk and then started to give their own answers.

The researcher also stressed it in the beginning of each interview that there were no right or wrong answers and that they should try being totally honest. The semi-structured interviews entailed a free-flowing conversation with the participants. At the start of each interview the researcher tried to make the participant as calm and relaxed as possible by making small talk. When the interviews were conducted, only the unit under investigation and the researcher were present, to prevent the other family members influencing observations regarding the unit under investigation. The researcher kept the interviews informal and easy flowing and the interviewees were allowed to talk freely, even a bit off the subject. This helped the researcher to form a clear picture of the situation and get some unexpected data.

This standard procedure was followed in the main study.

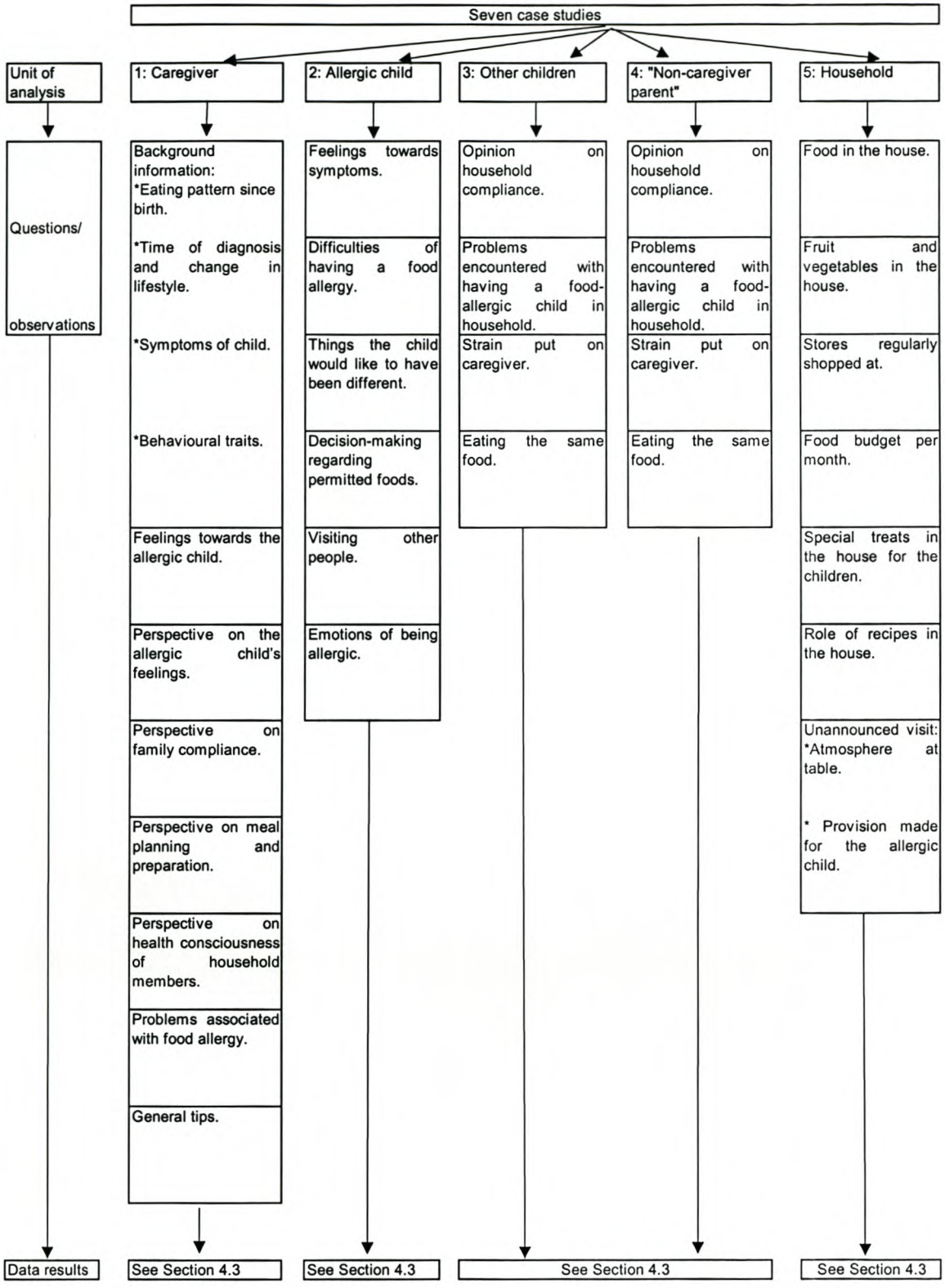

FIGURE 4.1: UNITS OF ANALYSIS

4.2.1.5 Planning a time schedule for the various interviews of units

A roster was developed with dates to visit all the units of analysis of all seven case studies.

TABLE 4.2: TIME SCHEDULE OF THE APPOINTMENTS WITH CASE STUDY UNITS.

Case study	Caregiver	Allergic child	Other children	Other parent	Household	Unannounced visit
1	31/01/02	31/01/02	-	04/02/02	16/02/02	04/03/02
2	24/01/02	25/01/02	04/02/02	05/02/02	27/02/02	05/03/02
3	25/01/02	25/01/02	-	6/02/02	7/02/02	02/03/02
4	28/01/02	29/01/02	2/02/02	06/02/02	16/02/02	03/03/02
5	23/01/02	4/02/02	04/02/02	06/02/02	19/02/02	05/03/02
6	25/01/02	30/01/02	-	04/02/02	08/02/03	09/02/03
7	23/01/02	25/01/02	28/02/02	02/02/02	04/02/02	04/02/02

When everybody in the house and particularly the caregiver was comfortable with the researcher, the household was investigated. In this phase, the researcher looked to see what food was in the house and asked questions to the caregiver about the household. The researcher also arrived unannounced for supper (see Table 4.1), their main meal. In doing this experience was gained of the (i) atmosphere at the table and it could be seen to what degree (ii) provision was made for the allergic child.

4.2.1.6 Development of a template

A template of questions for all five units of investigation was developed, representing the questions asked during the main study per unit (see Table 4.2).

TABLE 4.3: DEVELOPED TEMPLATE FOR UNITS UNDER INVESTIGATION.

Visit number	Unit	Questions pertaining to:
1	**Caregiver**	Allergic child's background: eating pattern since birth. time of diagnosis and change in life style. symptoms of child. behavioural traits.
		Feelings towards the allergic child.
		Perspective on the allergic child's feelings.
		Perspective on family cohesion.
		Perspective on meal planning and preparation.
		Perspectives on health consciousness of household members.
		Problems associated with food allergy.
		General tips.
2	**Allergic child**	Feelings towards symptoms.
		Difficulties of having a food allergy.
		Things the child would like to have been different.
		Decision-making regarding permitted foods.
		Visiting other people.
		Emotions of being allergic.
3 and 4	**Other children and "non-caregiver parent"**	Opinion on household cohesion.
		Problems encountered with having a food-allergic child in the household.
		Strain put on caregiver.
		Eating the same food.
5	**Household**	Food in the house.
		Fruit and vegetables in the house.
		Stores regularly shopped at.
		Food budget per month.
		Special treats in the house for the children.
		Role of recipes in the house.
		Unannounced visit: atmosphere at table. provision made for allergic child.

4.2.2 Main study

The caregivers of the seven case studies (Table 4.1) were informed that they were included as participants in the case studies and volunteered their full co-operation. It was also stressed that ethical permission had been granted to conduct the study from the Department of Research Development and Support, Faculty of Health Science, Tygerberg Campus, University of Stellenbosch (see Addendum 1).

The interviewees were contacted in advance to make appointments with each of the units separately. The interviews were conducted at the respective homes, firstly because it was a familiar environment, setting them at ease, but secondly so that the researcher could observe the environment of the allergic child more carefully – a procedure recommended by Seidman (1998:3). No research was done on weekends, because weekday patterns are expected to differ from weekends.

4.2.3 Analysis of data

Mostly when qualitative data are analysed the quasi-judicial case study method or content analysis is used. This is not always the case. The method of analysis largely depends on the researcher's aim for the data (Robson, 1995:372-373; Mouton, 2000:164-165). The analysis is as much a test of the enquirer as it is a test of the data (Robson, 1995:374). Qualitative analysis remains much closer to "codified common sense" than the statistical analysis of quantitative data. However, when humans are responsible for the interpretation of the data, care and thought must be given to the issue of bias (Robson, 11995:374). "A systematic approach is suggested, which will minimise human errors, yet there must still be room for interpretation when qualitative data are analysed" (Robson, 1995:374).

It was decided that the best way to analyse the qualitative data obtained through this study would be with the help of content analysis – a technique explained by Mouton (2000:164) - of the templates represented on answer sheets. The researcher completed the question sheets during the interviews.

The data from each case was described on its own, hereby keeping each case separate. The seven case studies were numbered as Case study 1, Case study 2, etc. to keep the identity of the case studies private. Five units of analysis were completed for every case study.

4.3 RESULTS AND DISCUSSION

Each of the seven case studies is discussed separately by means of the framework of the developed template with the five units and the corresponding questions. The data of the unit of a "non-caregiver" and "the other children in the household" were combined, because they had the same set of questions.

4.3.1 Case study 1

He is a six-year-old boy, allergic to cow's milk and is hyperactive. He lives with both parents and a brother of nine months. Due to his hyperactivity sugar intake was restricted, this was reported by the parents as a recommendation by a doctor, however, no scientific evidence could be found for this widely supported

dietary restriction for hyperactivity (Lucas, 1996:272; Kanarek, 1994:173; Hoover & Milich, 1994:501; Krummel, Seligson & Guthrie, 1996:31).

4.3.1.1 Case study 1, Unit 1: Caregiver

Allergic child's background: eating habits since birth He was breast-fed until the age of 18 months. He never displayed a healthy appetite, but this improved after being diagnosed. Directly after he started drinking cow's milk, he got a skin condition. He never liked to eat egg and he would always reject it after the first bite. Until he was two and a half years of age, the main foods he ate were butternut and sweet potato. When he was nearly three years of age he had his first bite of meat, but this also did not appeal to him very much. He also does not like meat patties or chips. He likes most fruits but vegetables are consumed through force-feeding. According to Chandra (2002:125) exclusive breast-feeding for four months or longer has a considerable effect in preventing or reducing the severity of, or proneness, to allergenicity. It is worth while noting that, although he was breast-fed for such a long period, he still developed a food allergy.

Allergic child's background: time of diagnosis and change in life style He was constantly sick or not feeling well along with the eczema, until diagnosed with cow's milk allergy at three years of age. Immediately all forms of cow's milk was omitted from his diet. It was also reported that he had a definite hyperactive reaction towards sweet (sugary) things, so "sugar was avoided as far as possible" (see above).

Allergic child's background: symptoms of the child He immediately gets a runny nose after cow's milk is consumed in any form. A post-nasal drip, mucus on the lungs, sinusitis and sometimes bronchitis may occur. When he was smaller he got a form of eczema, but that has now gone. The only other symptom is a cough - all symptoms commonly associated with cow's milk allergy (Groenewald, 1998:2; Frazier, 1975:74; Steinman, 2002).

Allergic child's background: behavioural traits He is a very talkative boy that finds it difficult to concentrate. He was diagnosed as a potential hyperactive child, but his condition has improved over the last few years. In the household, no fuss is made of his food allergy, so it does not really bother him, although he sometimes demands dairy products, especially ice cream. He is easy to control and handle in the house, but when he goes to friends or parties he eats incorrectly and becomes very active. Typically, allergic children sometimes crave the food they are allergic to (Dr. Steinman, Personal communication, June 2002).

Feelings towards the allergic child The caregiver feels confident that he is a happy, normal boy at home with only a few problems, but she said she did suspect that the moment he had to go to parties or visit family or friends he felt a bit frightened. Erikson's well known therory on human development based on the eight stages may be relevant to this child's development. In their second and third year independency, drive, feelings of failure and shyness are established (Craig, 1996:59). Care must be taken that the boy developments healthily.

She stated that the family made no fuss about the allergy and accepted the situation easily, but sometimes other people found it "funny". This phenomenon is also mentioned by Mandell, Curtis, Gold and Hardie (2002:95).

Perspective on the allergic child's feelings She did not think he knows he is a bit different from the other children. If it has an effect on him it is very insignificant and she is not worried about it. This is supported by further observation of units of analysis.

Perspectives on family cohesion According to the caregiver the family cohesion is extremely positive, but the moment relatives (especially her mother-in-law) visit their home or is visiting by the family, there usually is a fight. They argue that just a little of the wrong food would have no effect on him and then they would give it to him behind his mother's back. Baker and David (1997:50) concluded in their study "having a food (allergic or) intolerance places many demands and stresses on both the child and family life". It is well known that food allergies have an impact on family cohesion (Sicherer, Noone & Muñoz-Furlong, 2001:462).

In the immediate household the only problem is that the father loves chocolates and would sit next to the allergic child and have a chocolate and the child is not allowed to have one. The caregiver said they were now trying to get the father to have his chocolate in privacy, so that the child does not have to know about it.

Perspectives on meal planning and preparation There is no planning of meals. The caregiver said she is bad at planning and because her husband is in the catering business their plans are constantly subject to change, so she "just goes with the flow." Little time is spent on preparation and the only rule is that everyone must be fed by 20h00.

Perspectives on health consciousness of household members The caregiver regards the household to be relatively health conscious. No sweets or artificial cooldrinks are kept in the house. If the children want something to eat during the day, they get either fruit or a slice of whole-wheat bread. Only food products with no preservatives are bought and she tries to have them eat five portions of fruit or vegetables during a day. It appears as if they are really health conscious, especially if the type and variety of food in the house is considered (see Section .3.3.1.4).

Problems associated with food allergy When the child is socialising, the mother can not monitor what food he consumes. She also said to be overprotective of him is just as bad - a statement supported by Mandell, Curtis, Gold and Hardie (2002:66). There is a thin line between probing and informing the other mothers of the child's problems and trusting him to tell others and bear the consequences if he eats something wrong. She usually tries to go along to parties and lets him eat anything he wants on his plate and then, when he goes to play, she picks out all the things he is not allowed to eat and throws that away (as he may return and consume more). This is a contradiction because she then allows him to eat food he is not permitted to have in her presence, but she argues it is important for him to socialise normally.

The caregiver argues that these days it is not bad manners to say "I have cholesterol problems, I am not allowed to eat that food", so she does not feel bad to call a mother and say that her son is coming to play there that afternoon, but that he is allergic to cow's milk, will she please kindly not give him any dairy products. Having done so prior to the visit, she was much more at ease with him playing at other children's homes. She had not come across a mother that was unco-operative.

General tips The following three general tips were given (i) let everybody in the household eat the same, it is easier on the child as well as the person responsible for food preparation. (ii) A homeopathic syrup, *Propelus Kid,* boosts the child's immune system and lessens the symptoms of the allergy. It is a normal immune boosting tonic, containing large amounts of propelus (component of bee's wax) and Echinacea (R

Voigt, personal communication, Naturopath, March 2002). (iii) When trying to make a creamy sauce, use processed cheese with very little milk; if you must cheat, it has the least affect on the allergic child. No scientific evidence could be found for this statement.

4.3.1.2 Case study 1, Unit 2: Allergic child

Feelings towards symptoms He dislikes it when his chest is tight because it prevents him from running fast, like the other children. It sometimes also troubles him that he is not feeling so well. Mandell, Curtis, Gold and Hardie (2002:99) also report that all restrictions put on children are reported as negative.

Difficulties of having a food allergy Before answering the child really pondered on the question before he said he thought it was going to visit friends for the first time. Again it was the social aspect that surfaced.

Things the child would like to have been different He is fine with the allergy. He said that he did not think it was out of the ordinary to have a food allergy. He is sad though, that he is not allowed to eat ice-cream more often.

Decision-making regarding permitted foods His mother taught him what he is allowed to eat and if he is not sure he asks her. If she is not around he will eat anything. She is very well informed, but sometimes he lacks the discipline to do what is right, but bear in mind that he is only six.

Visiting other people On this matter he did not respond for a long time, and then said he did not know.

Emotions of being allergic He has no emotions of feeling different, but he confesses that occasionally some friends teased. He said that it did not matter that much. Yet, for him to report it to the researcher, it must have had an effect on him. The recurring matter that come up in the interviews is the social implications that this allergy has on him.

4.3.1.3 Case study 1, Unit 3 and 4: Rest of the family

The younger brother is still being breast-fed, so he is too young to communicate meaningfully. Only the father was interviewed.

Opinion on household's cohesion He thinks the family's cohesion is very good and said it helped a lot to have the mother at home to organise the household. He thought the food allergy of their son had no affect on the cohesion of the family.

Problems encountered with having a food-allergic child in the household According to him there were restrictions put on the household that affected their everyday living. He talked about the financial implications of having an allergic child. According to Chandra (2000:273) the second most prominent reason for current interest in food allergies is due to the high health-care cost of treating these individuals.

Furthermore, omitting simple pleasures like eating ice cream on a Sunday are inconvenient. He has difficulty adapting to the restrictions like not being allowed to eat chocolate in front of his son.

Strain put on caregiver In the beginning, he stated, it was difficult, because she had to try everything and be creative in her cooking. However, now he thinks she has it under control. He said she is a very positive person and he thinks that helped.

Eating the same food When they eat-out – and they do this often - the allergic child eats differently. At home, they all try to eat the same.

4.3.1.4 Case study 1, Unit 5: Survey of aspects of the household

Food in the house

Bread, cereal and pasta Rice Krispies, Pronutro, Special K, Corn Flakes, *brown rice, pasta, cannelloni, popcorn, flour, soups, rusks and bread*

Vegetables *Potato, onions, aubergines, butternut, carrots and lettuce*

Fruits Fresh juice, olives, tomatoes, cucumber, lemon, apples, grapes plums, jams, canned granadilla and canned guava pieces

Milk, yoghurt and cheese *Milk and cheese*

Meat, fish, poultry and dried beans *Eggs, lamb chops, chicken filets,* marmite *and nuts*

Fats, oils and sweets Castor sugar, sugar, oil, mayonnaise, mustard, peanut butter, syrup, salt and vinegar

Other Tea, coffee, vanilla essence, baking powder and gelatine.

They had a wide range of fresh products in their house that supports the conclusion that they are health conscious. The house does stock dairy products, that the allergic child is not permitted to eat, but it is for the rest of the household.

Stores regularly shopped at The caregiver buys most of the household's food at *Pick 'n Pay*. However, meat, milk and vegetables are purchased at Woolworths, because of their high quality assurance standards and the fact that their chicken has the 'no animal by-products in our chickens' feed' claim.

The food budget per month An estimated minimum of R2000 per month for four people including the baby.

Special treats in the house for the children She does not have any sweets or cookies in the house, due to the allergic child's hyperactivity. If she wants to give them a treat, it is usually in the form of a piece of fruit. The researcher argues that this approach will also established healthy eating patterns with the child. If it is a special occasion, they will order a large milkshake at a restaurant and all three of them will drink together of the one milkshake. They argue that if he only drinks a third of a milkshake on special occasions it is not too harmful.

The role of recipes in the household There are two recipe books in the household, one being "Kook en Geniet" and another one a file of copied recipes or recipes cut out of a magazine. Recipes will be used when something is made for the first time, not again after that. Recipes do not play a significant role in their daily routine.

4.3.1.5 Case study 1: General observations

The unannounced supper that the researcher attended was very pleasant. On that specific day the father had a work obligation and did not join the rest of the household for supper. Only the mother and the allergic child were present. The baby was already in bed, so everything was calm and relaxed. They had Spaghetti Bolognaise and a green salad.

Throughout the study the researcher felt welcome in their home. The family is obviously very close and enjoys each other's company. The family cohesion in the house is good and no pretence is detected in that. Although, the father works long hours, he stated that he enjoyed relaxing in his own home and treated himself with chocolates but sometimes found it difficult to accommodate the allergic child.

Both the parents and the allergic child are very spontaneous and talked easily and openly to the researcher. The researcher is under the impression that the food allergy is not a big problem in this specific household.

4.3.2 Case study 2

She is an extremely friendly and spontaneous girl of nine living with her parents and two sisters. She is allergic to cow's milk and maize.

4.3.2.1 Case study 2, Unit 1: Caregiver

Allergic child's background: eating habits since birth She was breast-fed until nine months after which her mother had to go back to work. She was a child that enjoyed food from the very beginning. From birth she was very healthy, and ate everything at any time and had no fuss with any food. At seven years of age, she started to develop constant stomach pains and a year and a half later was diagnosed with cow's milk and maize allergy. Chandra (2002:2) stated that breast-feeding could lessen the severity of a food allergy.

Allergic child's background: time of diagnosis and change in life style She was diagnosed shortly before the study was conducted. After maize and cow's milk were omitted from her diet, the stomach pains stopped.

Cow's milk and cheese were replaced by goat's milk and cheese respectively. Yoghurt and pasta products were avoided. They now only eat buckwheat pasta, rye bread and rice cakes. It appears as if they may confuse wheat and maize allergy. Continually during this case study the following two issues arose: (i) was the child allergic to maize or (ii) was the child really tested for a food allergy using the gold standard technique.

These parents made an issue of avoiding pasta. Pasta is usually made from wheat and often more specifically durum wheat, but the high-protein pastas may contain maize and soy (Bennion & Scheule, 2000:282). However, they are not readily found in South Africa. Therefore, pasta is not the big problem, there are products more problematic than pasta that must be avoided.

Allergic child's background: symptoms of the child Stomach pain was suddenly dominant and then she had periods of eczema. These lasted for a few years; she also had constant bladder infection, due to her low immunity. Chandra (2000:276) describes the reasons for immunological dysfunction with food allergy.

Allergic child's background: behavioural traits She is a very happy child with no problems. She did however sometimes miss social events because she had chronic stomach aches. Since she had been diagnosed with a food allergy she once told her mom that she was sorry that they had to make such an effort when preparing food, in order to accommodate her. She felt like a burden to her family.

Feelings towards the allergic child. She was very concerned about her child. The child did not want to go to school due to the constant stomach pains. She also stayed away from social events because she constantly complained of pain. Her grades were also affected negatively with the onset of the stomach pains. She eventually also had small personality changes. From being an enthusiastic and spontaneous girl, she

became constantly tired and shy. After having been diagnosed, she slowly returned to normal, although she became a poor eater. The food allergy had a psychological affect on the girl, both on her manner of socialising and on her personality.

Perspective on the allergic child's feelings She thinks the child misses bread and dairy products, but without complaining. The fun is taken out of eating, but at least the constant pain has gone. She thinks the absence of pain is all that motivates her to comply with her diet. The caregiver now stated that they omit bread, but earlier on did not mention it. Ironically bread seldom contains maize.

Perspectives on family cohesion They are a happy family and there is no problem.

Perspectives on meal planning and preparation She goes shopping once a month, but she takes the meat out of the freezer the night before, as they live on a farm. She prepares the food for ther own and her sister's household in town at her sisters' house where she spends the afternoons, so that she will be able to drive the children to their various extra-curricular activities. She keeps most of the fresh products at her sister's house and buys in town what she still needs. The household members all eat the same. The caregiver appears to be a very organised woman, and she tries to have the same discipline towards the food allergy. They all eat the same food together. If they were eating pasta, she would just make the allergic child's separate from the rest of the household, with maize-free pasta, although most pastas are maize-free. The other children in the house are also old enough to understand the situation - so there is no problem amongst the children.

Previously they went to eat out often, but now that the one child is diagnosed with a food allergy, it is a problem to which they still have no answer, because now she only eats chips at a restaurant while they were having big, enjoyable meals. This is a problem also noted by Willingham (2000:123).

Perspectives on health consciousness of household members They are not really health conscious; they eat what they like, mainly according to food preference and only sometimes thought is given to health. Even after the child was diagnosed with a food allergy, she did not give more thought to health.

Problems associated with food allergy They are outdoor people and when they go camping or 4x4 driving it is difficult to prepare maize-free and milk-free food. The moment their daily routine changes, as during holidays, they have difficulty preparing permitted food and therefore difficulty complying with the allergic child's diet.

General tips No tips were given.

4.3.2.2 Case study 2, Unit 2: Allergic child

Feelings towards symptoms The immense pain, and the fact that nobody knew what was wrong with her, frightened her. She was scared of her undiagnosed condition. She appears to be a sensitive child. She sometimes wished that she could remember how it felt not to have constant stomach pain. Only the stomach pains were a problem, she initially ascribed the eczema to her swimming.

Difficulties of having a food allergy She has a problem going to parties where one socialises with friends and strangers and then having to explain that she may not eat everything.

Things the child would like to have been different She dislikes not being permitted to eat cookies and drink milk. According to Mandell, Curtis, Gold and Hardie (2002:99) these restrictions put on her, are mostly experienced as negative by the child.

Decision-making regarding permitted foods She usually asks her mother to read the food labels of products. Her mother also taught her what she was allowed to have. If she was in doubt, she asked someone who would know. She admitted to being unsure rather regularly. The researcher suspects that they know very little of hidden allergens. Baker and David (1997:46) commented that "reading labels is no easy task, because many food manufacturers use scientific words or chemical names which mean nothing to the lay person". Even asking 'someone who would know' is according to Altschul, Scherrer, Muňoz-Furlong and Sicherer (2001:468) a problem. They stated that "current labelling and manufacturing procedures present an enormous variety of challenges for food-allergic individual and their families" (p469).

Visiting other people She keeps quiet until she has to eat and then she would say she is food-allergic, or just go without any food.

Emotions of being allergic She does not feel different, although she knows she is not like the average child. She said before she was diagnosed with a food allergy, she did not even know people could be allergic to food.

4.3.2.3 Case study 2, Unit 3 and 4: Rest of the family

Opinion on household's cohesion They did not think that having a food-allergic child in the household had any affect on their family cohesion. The father stated that it made going out or camping very difficult, but they must learn how to handle it. All the problems they encountered, according to him, were practical ones, none emotional.

Problems encountered with having a food-allergic individual in the household The household had to learn to adapt to situations where it is difficult to eat food that is free from maize and milk. Sometimes when they are in difficult situations they would eat differently from the allergic child. Holidays are also a problem because then they go out a lot and like to treat themselves by eating food they like, and then it is difficult having a food-allergic individual in the house.

Strain put on the caregiver They do not think it is very difficult having a food-allergic child, although the caregiver has to experiment with cooking again.

Eating the same food They mostly all eat the same - except when they have pasta or bread. When it comes to treats like cake, there is also a noticeable difference; the allergic child mostly restrains herself from having cake.

4.3.2.4 Case study 2, Unit 4: Survey of aspects of the household

Food in the house

Bread, cereal and pasta *Corn flakes, Pronutro, Weet-Bix, Rice Crispies,* mealie pap, buckwheat pasta, potato flour, muffin and cake gluten-free mix, spaghetti, self-raising flour, *Two-minute-noodles, Bisto,* sauces, soup powder, and bread and maize flour

Vegetables Potatoes, sweet-potatoes and onions

Fruits Lettuce, cucumber, tomatoes, prunes, apples, paw-paw, peaches, oranges, lemons tomato sauce, chutney, tomato paste, beetroot, pineapple pieces, jam, canned peaches, and olives

Milk, yoghurt and cheese Soy milk, goat's milk, milk, cheese and yoghurt

Meat, fish, poultry and dry beans Pork chops, chicken, chicken stir-fry corned beef, viennas, Marmite, baked beans, gelatine, soy* and tuna

Fats, oils and sweets Carob, oil, party dip, castor sugar, condensed milk, peanut butter, butter salt, mayonnaise, spices and salad dressing

Other Tea, coffee and carbonated drinks.
*Regarded as a meat alternative and therefore included in this group.

They have a variety of food and a variety of fresh products are available in the house. Provision is made for the allergic child by the maize flour and goat's milk available for the child. However, the caregiver said, she buy goat's milk on a daily basis but the potato flour she only used once and then it did not work and she has not used it since. The carob and other products she buys regularly. Although, they do not give much thought to healthy eating, they eat relatively healthy.

According to Steinman (2002) goat's milk share allergenicity with cow's milk, however the mother replaces the cow's milk with goats milk, thus the child is either not affected by it or secondly the mother or child are not aware of the fact that cow's-and goat's milk share allergenicity and look for the symptoms elsewhere.

Stores regularly shopped at The caregiver goes to Pick 'n Pay Hypermarket once a month and does all the shopping there. She buys the fresh products on a daily basis.

The food budget per month She thinks around R2 000 per month for five people.

Special treats in the house for the children. There are always small sugary sweets in the house, seldom chocolates and cookies. They only have chips when entertaining.

The role recipes play in the household. There are seven to ten recipe books, but seldom used. She would sometimes use them for reference purposes when looking for something special. Recipes do not play a prominent role in their house.

4.3.2.5 Case study 2: General observations

The household looks very happy and healthy. They are still very new in the process of avoiding maize and milk in the diet, but are very willing to learn. When the researcher visited them for lunch, they had sweet and sour pork stir-fry, with a side salad and fruit salad.

The caregiver has a very busy schedule between working on the farm in the mornings and then being in town the whole afternoon until approximately 18h00 when she returns home and sees to everything there.

The household really tries to adapt to their new life style.

4.3.3 Case study 3

During Case study 3, the researcher had trouble with the cultural differences between the researcher and the household. This experience during data collection is not exceptional. Champagne (2001:185) mentioned that cross-cultural examination is seldom a success.

She is an eight year old girl and allergic to cow's milk, fish and sometimes egg. They also said she is allergic to sugar, tomato and crisps. According to *Allergy Advisor* (Steinman, 2002), there is no traceable allergen in chips or sugar, therefore the researcher concluded that she may have an intolerance to the large amounts of preservatives and colourants in crisps. She lives with her mother and father, but in the daytime she is with her grandmother and grandfather. The grandmother is seen as her caregiver. She has an older brother, but he is not living with them. She is extremely thin and has severe eczema.

4.3.3.1 Case study 3, Unit 1: Caregiver (grandmother)

Allergic child's background: eating habits since birth She was breast-fed for a week and then put on formula milk. She had a healthy appetite from the very beginning and was on the bottle and soft foods up until two years of age. She ate everything until she was diagnosed at two. She was breast-fed for a very short period of time. Studies showed that exclusive breast-feeding and delayed introduction of allergenic solid foods can prevent the severeness of food allergies (Chandra, 2000:273).

Allergic child's background: time of diagnosis and change in life style She was diagnosed at two and the bottle was omitted and replaced by rooibos tea. The doctor did not say to what the child was allergic, just that the child is allergic to some foods, so in the beginning it was quite difficult for them to determine what the problematic foods were. In the beginning, it was also difficult to feed her properly without her getting hungry soon or with her being satisfied with the meals. They learned by trial-and-error. She never really accepted her situation with food and tried to cheat if she got the chance. It appears as if she was not tested according to the gold standard technique, otherwise the doctor would have been able to tell her to what she is allergic. They definitely did not receive enough support after diagnosis – a need stressed by the research of Mandell, Curtis, Gold and Hardie (2002:95-99).

Allergic child's background: symptoms of the child According to the caregiver (grandmother), the biggest problem is the constant itching she experiences. Her skin gets reddish and sometimes small blisters form on her face and legs. Her neck becomes flaky and rough. Her mouth also becomes raw. If the wrong food is eaten over a period of time, for instance on weekends, she starts coughing and is constantly tired. She is also more irritable when she eats the wrong food. These symptoms are commonly found in individuals allergic to cow's milk (Steinman, 2002).

The child herself, when later interviewed, described her symptoms as small bubbles that form around her arms, mouth, eyes and legs, while her mother, who was also interviewed later, said she gets eczema.

Allergic child's background: behavioural traits She is very shy to strangers but with family and friends she is spontaneous. According to her grandmother she is quite spoilt and strong willed. She is sensitive about her

symptoms. Her sensitivity and shyness regarding her symptoms led the researcher to believe that the food allergy must have an effect on her social development.

Feelings towards the allergic child She loves the child like her own, but is quite irritated with her eating habits. The child is naughty and very specific and picky on what foods she wants and when. She feels the child must try harder to avoid the problematic foods because she is not a baby anymore and must start to take responsibility for herself. Baker and David (1997:46) recognised this phenomenon that the children find it hard to comply to the avoidance diets and that this lead to family stress.

Perspective on the allergic child's feelings She does not really think the allergy is a problem for the child, because otherwise the child would have tried to eat right. She would seldom mention anything nor does she complain about her food allergy to her grandmother, but her mother said she sometimes complained of the symptoms towards her. When she was still in kindergarten, they sometimes had to take her out of the school if the symptoms were very bad, because the other children teased her. According to the grandmother and the mother she is definitely shy about her symptoms. Her shyness will have a negative affect on her social development.

Perspectives on family cohesion Her grandmother is very strict with her and she is not allowed to eat anything wrong when visiting there, while her mother is less strict and she is allowed to cheat. The problem is that the father does not understand the food allergy and seems apathetic towards the problem. The father also dislikes the fights over the allergy. He makes no secret of it that he thinks everybody is overreacting and that they should just leave the child alone. This motivates the child to cheat. Dietary compliance in the grandmother's house is good. Just the grandmother and grandfather, and sometimes the allergic child, live there.

She stated that they fought about this at least once a week. Firstly, the grandmother and her daughter argue about the child's eating habits when the grandmother visits at her parents' house. Secondly, the parents argue about the right approach towards the food-allergy and if it exists at all.

Family cohesion is defined as 'ability of family members to get along with one another" by Sicherer, Noone and Muñoz-Furlong (2001:462). In the allergic child's parents' house, the researcher suspects that the family cohesion may be a problem.

Caregiver's perspective on meal planning and preparation *They do their shopping in the beginning of the week and then on a daily basis they decide what will be prepared on that specific day. They start preparation in the afternoon because they do not like to eat late, and they eat before the allergic child's mother comes to fetch her at 18h00. The caregiver's husband helps her to prepare the meals. They have an organised pattern to which they prepare food.*

Perspectives on health consciousness of household members *They really try to be health conscious, but their limited food budget puts restrictions on them. The selective food taste of the allergic child also makes preparing healthy food difficult.*

Problems associated with food allergy *The allergic child, as well as her mother and father, is not conscious of what the child should eat and are not disciplined about the allergy. It makes it therefore difficult to control the situation and symptoms.*

General tips When a skin condition is experienced, the child must be careful of anything that can have a further negative effect on the skin, like a cortisone ointment, that makes the skin thin. If this is put on the skin regularly, a secondary problem can be encountered. This phenomenon is confirmed by a chemist, Maren Stalman (Personal communication, 27 July 2002).

4.3.3.2 Case study 3, Unit 2: Allergic child

The child was very shy when talking to the researcher and a lot of probing had to be used. The child never relaxed throughout the interview.

Feelings towards symptoms She confessed to feeling shy and ashamed of the symptoms and that she disliked her condition extremely (probing was used).

Difficulties of having a food allergy Not being allowed to eat what you like and accepting the symptoms (probing was used).

Things the child would like to have been different She would like to eat lollypops without having an eczema attack afterwards. After a lot of thinking she said she would like to eat normally.

Decision-making regarding permitted foods Her grandmother has taught her what she is allowed to eat, but she only considers that when her grandmother is near. She said she hated not being allowed to eat what she wants.

Visiting other people When she visits other people, she ignores that she is food-allergic and eats whatever she wants to (probing was used).

Emotions of being allergic She feels different but only because of her symptoms.

4.3.3.3 Case study 3, Unit 3: The mother

Opinion on household's cohesion It is very difficult to accomplish family cohesion. They are constantly fighting about the child's eating pattern and what she is allowed to eat. According to the mother her husband does not believe the child has a food allergy. He says she is only naughty and has a skin condition. He does not want an argument at every meal, so he thinks it best if they just ignore the whole issue and let her eat whatever she wants. The mother said both father and daughter are happy when the child can eat what she wants, so she permits it rather than having to fight the whole time.

Problems encountered with having a food-allergic individual in the household For them the biggest problem is that the allergic child does not want to give her co-operation about eating the right foods. Furthermore, everybody in the household does not feel equally strong about the issue.

Did she think it was difficult for the caregiver to have a food-allergic child in the household The mother does not think the grandmother has any difficulties when preparing a meal, but she feels she definitely does have a problem, because she does not know how to please everyone.

Are you health conscious? She is not particularly health conscious, but she tries to be from time to time.

4.3.3.4 Case study 3, Unit 5: Survey of aspects of the household

Food in the house

Bread, cereal and pasta Cake flour, *Weet-Bix*, rice, maize meal, spaghetti and *Bisto*
Vegetables Potatoes and onions

Fruits Apples, cucumber, tomato, lettuce, tomato sauce, chutney and jam
Milk, yoghurt and cheese Milk, feta, cheese and evaporated milk
Meat, fish, poultry and dry beans Eggs, Marmite, sausage and baked beans

Fats, oils and sweets Butter, sugar, mayonnaise, peanut butter, spices and salad dressing oil

Other Tea, coffee, Worcester sauce and salt.

There is a limited amount of food in the house, probably due to the financial restrictions put on them.

The places where shopping is mostly done Shopping is mostly done at *Pick 'n Pay, Shoprite/Checkers.*

The food budget per month The estimated food budget per month was about R450 for three people. They are still in the middle-income (LSM) group, although they really have a limited amount of money for food.

Special treats in the house for the children There is seldom something special in the house for the child, mostly because it is too expensive.

The role recipes play in the household They have one recipe book in the house, which has never been opened. They do not use recipes at all. They make everything by experience or on impulse.

4.3.3.5 Case study 3: General observations

The evening the researcher went for the unannounced visit the household had bean stew with tomato salad. They had the neighbours over for dinner, so the researcher did not stay long.

The researcher concluded that the grandmother is very strict with the allergic child and that the child is afraid of her grandmother. At home, the father definitely wants nothing to do with the allergic condition of the child and the mother just tries to establish some form of peace. The child knows this and definitely uses this to her own "advantage". Family cohesion is lacking in this household.

4.3.4 Case study 4

The allergic child is a girl of thirteen years and allergic to egg and peanuts. She lives with her parents and a brother and sister. The brother is seventeen and the sister eleven years of age. She looks very healthy and happy.

4.3.4.1 Case study 4, Unit 1: Caregiver

Allergic child's background: eating habits since birth The child never had a healthy appetite and was ill constantly. Every time after the child ate an egg, she vomited. They only thought it was "too heavy for her stomach" and never tested for a food allergy. One day after eating a single peanut the child just collapsed

and did not respond. She never enjoyed vegetables until fairly recently. She is not a food lover and she would not notice it if she skipped meals.

Allergic child's background: time of diagnosis and change in life style She was diagnosed when she was about four and a half years of age. After that, she was not exposed to either egg or peanut again. She does not even wash the dishes if someone else ate either egg or peanuts.

No food that contains egg are bought, except peanut butter for the other children, but they hide it and they know that they are not allowed to leave anything unwashed that had been in contact with the peanut butter.

Allergic child's background: symptoms of the child She gets asthma and abdominal pains. Vomiting sometimes occurs. When she was younger, she got eczema to some extent and sometimes her eyes also got swollen. In the beginning she also complained of constant tiredness. With peanuts anaphylactic reactions occur, as was the case with her. According to Thompson and Chandra (2002:90) "by far the most severe and feared manifestation of food allergy is anaphylaxis. The vast majority of food-induced anaphylactic reactions are triggered by relatively few foods, namely peanut, tree nut, fish, shellfish, egg, milk and soy."

Allergic child's background: behavioural traits She is a very happy thirteen-year-old, with lots of friends. All her friends and their parents know about her food allergy and that makes the whole situation easier. In the household everybody eats the same and no fuss is made about it. She never complains about her condition. She only remarked once that she wishes a machine could be invented that could detect if there was any egg or peanut in food. She was taught well and looks for allergens and hidden allergens. They probably do not know all the hidden allergens, but they have all gone to great lengths to investigate the issue. The terminology problems encountered with food labelling are also acknowledged by Joshi, Mofidi and Sicherer (2002:1019) and Altschul, Scherrer, Muñoz-Furlong and Sicherer (2001:468).

Feelings towards the allergic child She feels sorry for the child, because so many things are withheld from her. She is also concerned about the child's health because of the food allergy. She has a low immunity and the caregiver is afraid that she is not doing all she could for her child.

Perspective on the allergic child's feelings She does not think it bothers the child being food allergic at all. She is comfortable with it in her social circle and does not find it difficult to refuse food, although she sometimes found it difficult in an unknown situation with strangers.

Perspectives on family cohesion She thinks the family's cohesion is very good. She buys special treats that everybody can eat and enjoy, but she also buys something for the rest of the household that are not egg or peanut allergic and that they like. She always has something that the allergic child likes to eat. She tries to prepare food that everybody can eat but once a month they like to have scrambled eggs and then she prepares something different for the allergic child. It is very obvious that the allergic child's needs are met and no distinction is made between the children.

Perspectives on meal planning and preparation. On Sundays, she plans the menus for the week ahead. The previous evening she would get the food out of the fridge. She does her shopping once a month, but buys the fresh products once a week. They eat their main meal at lunch. She and her husband eat at one o'clock in the afternoon and then she dishes up a plate for every child, which they eat when they get home

from school. She finds that they are hungry when they come from school and if they do not have their main meal in the afternoon, they snack the whole day. The household is run according to strict guidelines and the caregiver takes pride in it.

Perspectives on health consciousness of household members She tries to be health conscious and get the household members so far. She knows that she does not do everything right, but she is not afraid that they eat unhealthily. They definitely get enough fruit and vegetables in their diet and when she prepares food she uses fats sparingly, so she is not worried.

Problems associated with food allergy She worries when she has to let the allergic child go to unknown places, especially when she goes alone. When, for instance, the child goes camping the caregiver (mother) tries to be on the food preparation team for the camp. However, common foods like noodle salad contains mayonnaise (which in turn contains egg). So it usually pays to be prepared and to send the child to camp with "allowed" food. Although, Mandell, Curtis, Gold and Hardie (2002:95) stated, "the anxiety is frequently interpreted as overreaction, overprotection, a sign of a 'neurotic mother'" it was concluded that the mother is none of the above, just caring.

General tips She said you should try to let the household go on normally as far possible, without letting the allergic child feel neglected. Care must also be taken that the allergic child does not feel as if she is a problem to the household, an idea supported by Willingham (2000:102).

4.3.4.2 Case study 4, Unit 2: Allergic child

Feelings towards symptoms She does not like the symptoms, but this is not a real problem to her. She says she is so used to them by now - she feels as if it is the only way to be. However, she does get discouraged when symptoms re-occur.

Difficulties of having a food allergy It is difficult going to family or friend's houses and being fussy with what you eat. She said she sometimes felt like a nuisance to the other people. It is also difficult to watch other people enjoy food but not be allowed to have it yourself.

Things the child would like to have been different She dislikes being nauseous sometimes and would like to be more relaxed in a strange environment.

Decision-making regarding permitted foods Experience helped a lot and when in doubt she would ask people. If she were still unsure, she would rather go without the suspicious food. She was well educated on the subject and shows a high degree of independence. The caregiver supported and informed the girl well.

Visiting other people All her best friends and their parents know that she is allergic to egg and peanuts, so visiting them is not a problem. But when going to strangers, she would just ask if there is something in the food that she is not allowed to eat.

Emotions of being allergic She sometimes felt different, especially when everybody else was enjoying something and she was not allowed to have it.

4.3.4.3 Case study 4, Unit 3 and 4: Rest of the family

Opinion on household's cohesion The family cohesion is not a problem, they are so used to having a food-allergic child in the household that it feels like normal. Furthermore, it is not a big issue because they still get everything they want and like. Her brother only said that sometimes the allergic child was lucky that she did not have to help with the washing of the dishes because there could be egg in the dishwater. "The unwitting exposure to allergens (hidden allergens) occur through ingestion, inhalation, breast feeding and skin contact" (Steinman, 2002B). Usually they are looked for on food labels (Joshi, Mofidi & Sicherer, 2002:1019) but this is a limited understanding of the mechanism.

Problems encountered with having a food-allergic individual in the household Eating or going out is definitely a problem. It is difficult to find a restaurant that everybody likes and has something safe for the allergic child to eat – a common problem encountered by food-allergic households (Willingham, 2000:101).

Strain put on the caregiver Sometimes they think the caregiver really has to be creative to prepare dishes or cakes, but otherwise they do not think she has a problem. She has adapted well.

Eating the same food They usually eat the same. Once or twice a month they would eat something that the allergic child is not allowed to have, but then they will prepare something she has a liking for.

4.3.4.4 Case study 4, Unit 5: Survey of aspects of the household

Food in the house

Breads, cereals and pasta White rice, flour, oats, maize meal, pasta, rusks, *Weet-Bix*, *Cornflakes, Rice Krispies*, *All Bran*, soup powders and pasta sauce
Vegetables Mealies, onions and potatoes

Fruits Grapes, tomatoes, apples, dried fruits, raisins, pineapple, peaches and bananas, beetroot, canned peaches, canned pears, onion mix, pineapple rings and fruit juice concentrates

Milk, yoghurt and cheese Milk, cheese, yoghurt and caramelised milk
Meat, fish, poultry and dry beans Eggs and tuna, corned beef, beans, Tuna mate, canned fish and marmite

Fats, oils, sugar Oil, sweets and crisps, popcorn, cookies, bacon kips, mayonnaise and jelly

Other Rooibos tea, English tea, herb teas, coffee, Milo and Elgin juice tea.

The house has a variety of food and seems to be well stocked with food. There is a variety and large amount of fresh products in the house. The household appears to be eating healthily.

The places where shopping is mostly done Fruit and Vegetable City for all the fresh products, while the monthly shopping is done at Checkers and Pick 'n Pay. She will go to a health shop once a month to buy the special things for the allergic child.

The food budget per month She was not sure but guessed around R1 400 for five people.

Special treats in the house for the children There is always something special in the house for the children. She has cookies, sweets, chocolates and fruits. She buys the special treats that are peanut and egg free making provision for the allergic child, but will sometimes buy those things that are not egg-free for the other children.

The role recipes play in the household She has approximately 10 to 12 recipe books, but she only uses them on special occasions. She does not use them for everyday cooking, because she prepares "plain" food. She had a food allergy manual written by Griffiths in 1986 that included tips and helps with food preparation.

4.3.4.5 Case study 4: General observations

The allergic child is a very happy and enthusiastic child. The researcher is under the impression that the child's food allergy is not a big problem to her.

When the researcher went for the unannounced visit, the conversations on table were very relaxed and comfortable. They had tuna cakes with tomato and onion mix, as well as a green salad, bean salad, carrot and pineapple salad and cold pasta. The house was also filled with the aroma of freshly baked egg-free oats cookies. The researcher is under the impression that the family have a healthy life style and is happy.

4.3.5 Case study 5

He is a twelve-year-old boy, who lives with his parents and older sister. His sister is 21 and also allergic to cow's milk. They originate from the Netherlands and their home language is Dutch..

4.3.5.1 Case study 5, Unit 1: Caregiver

Allergic child's background eating habits since birth He was breast-fed until three months, but then the mother developed problems and breast-feeding was discontinued within two days. They never had success on the bottle, because he got stomach cramps. When four and a half months old, he was taken off the bottle and ate mashed fruit and vegetables. When he turned six months he ate potato and yoghurt. At seven months, he was introduced to meat, fish, chicken, egg and bread. He had no problem with any of these foods. When porridge was given, he rejected it immediately and showed signs of diarrhoea. When the milk in the porridge was replaced by soy milk, he was fine – this replacement having no effect on his stomach. At the age of nine months they started suspecting that he too was allergic to cow's milk. A similar diagnosis had been made earlier on his older sister and nephew.

He never liked any green vegetables and still has no appetite for food. He now totally omits cow's milk from his diet.

Allergic child's background: time of diagnosis and change in life style He was diagnosed at the age of nine months at a clinic in the Netherlands.

Allergic child's background: symptoms of the child According to his mother he gets sinusitis, blocked ears, a cough and mucous in his chest. He also gets diarrhoea. He later added to the list by saying that he

sometimes vomited and got headaches from drinking milk. He did not feel physically fit to play sport. These symptoms are typical of cow's milk allergy (Steinman, 2000).

Allergic child's background: behavioural traits He is a happy, healthy boy. Because of his strange accent the other children tease him, so he said when they tease or say something about his food allergy it does not bother him because he is used to it. His nephew, with whom he grew up closely, is also milk allergic. So it was never difficult for him to accept it, also taking into account that his sister is allergic to cow's milk.

Feelings towards the allergic child She feels no pity for him, where the food is concerned. She feels that he eats a balanced diet and he is not really deprived of anything. The only issue she has is that in the Netherlands the variety of different products are so big and here in South Africa the choices are limited. It is difficult to give food-allergic children a variety of choices among certain products, for instance chocolates.

In their household no big fuss is made of the fact that he is food allergic, so he does not regard it as something out of the ordinary. The caregiver really made a study on cow's milk allergy, she knows all the alternatives, where to buy them and what to do. She also taught her children well on the subject.

Perspective on the allergic child's feelings She does not think that he has any problems with being food allergic, because no fuss is made about it, and he might even like it, because he gets special treatment.

Perspectives on family cohesion There is no problem with family cohesion, because everything is always milk-free for everybody. She has nice recipes so that nobody notices that the recipes contain no cow's milk.

Perspectives on meal planning and preparation She always has the basic things in the house, and then she goes to the green grocer and sees what looks fresh and appetising. Depending on what she purchased at the green grocer she prepares meat that she knows goes well with the vegetables. Sometimes she knows three days in advance what they will eat and sometimes only three hours.

If the household is health conscious The caregiver thinks so. Because they constantly have to take note of food, due to the food allergies of the children, she reads a lot about nutrition and supplementation. Therefore she tried from the beginning to cook low in salt, low in fat and with large amounts of fruit and vegetables. She is well informed on healthy eating and nutrition.

Problems associated with food allergy The restrictions put on the child due to the food allergy is a problem to her. When he goes on camps or parties, it is always a problem to accommodate him. She tries to send something along for him, but for the child it is not always nice to take his own different food, along.

General tips The following general tips were given (i) Do not make a big deal of the fact that there is a food-allergic child in the household, just accept it. (ii) Sometimes food that people think is allergen-free, contains allergens, e.g. *Provita* contains milk. (iii) When goat's milk is used to bake, add half an egg extra, because it does not set so well as a product with cow's milk. Cow's milk contains 3.3 g protein per 100 g, while goat's milk contains 3,6 g protein per 100 g (Langenhoven, Kruger, Gouws & Faber, 1991: 8,9). The protein value differs negligibly – possibly the calcium caseïnate in goat's milk is higher. This possibility could not be substantiated in available literature. However, "goat's milk often provokes reactions to people who are already sensitive to cow's milk only with the IgE response to the casein fractions being weaker to goat's milk than that to cow" (Steinman, 2002). In view of Steinman's comment, it seems as though there is indirect

substantiation for the difference in setting ability of cow's milk versus goat's milk (as it is concluded from Steinman's quotation that cow's milk has a higher casein content than goat's milk).

This caregiver really investigated the cow's milk allergic condition and mastered it. She has wonderful insight and common sense.

4.3.5.2 Case study 5, Unit 2: Allergic child

Feelings towards symptoms He stated that it is not nice to have the symptoms, but that he is so used to it that it has little effect on him now. He would definitely prefer not to have it, but it is not an issue for him.

The difficult part of being food allergic For him the most difficult part is to have to read every label and always ask what is in the food. The symptoms he has got used to, although he would not mind if they disappeared. The caregiver taught the boy to be an informed child about his condition and that helped him to better cope with his situation. He appears to be self-reliable due to his upbringing.

Things the child would like to have been different He would much rather be allergic to pulses! This indicates that they sometimes eat pulses, which further substantiates the observation that the caregiver appears to be health conscious.

Decision-making regarding permitted foods He knows what contains milk and if in doubt he simply asks or reads the label. In the house, he knows everything is safe. He has been educated to read food labels. As Joshi et al. (2002:1019) and Altschul et al. (2001:468) explain it is quite difficult to be really informed about food labels due to the enormous amount of "complex ingredient terminology" and errors occurring on food labels.

Visiting other people He usually asks the person who made the food if he is permitted to eat it. Otherwise, he just goes without food. If he is in doubt, he rather stays away from it. He confessed that he sometimes said that he was on a diet and not allowed to eat, because saying that is easier than explaining his food allergy. He learnt discipline as a child and can now use it to his advantage.

Emotions of being allergic His close friends do not tease him, so that when the other children give him nicknames due to his food allergy, it really did not bother him.

4.3.5.3 Case study 5, Unit 3 and 4: Rest of the family

Opinion on household's cohesion The only other child in the house is also allergic to milk, so the whole household eats the same. The caregiver has gone to great lengths to formulate recipes and dishes that are firstly appetising and secondly healthy without having cow's milk in them. Therefore, nobody in the household feel as if they are missing out. Family cohesion is no problem.

The big problems with having a food-allergic child in the household The biggest problem they experience is that there is such a small variation of allergen-free products on the market. They have difficulty obtaining goat's milk or milk-free chocolates.

Strain put on the caregiver When shopping it is sometimes difficult to get the right products. In the beginning it must have been difficult to establish an efficient and proper method of food preparation that

accommodated the allergic child's condition, but after that was in place, they did not think it was difficult for the caregiver to accommodate the allergic child.

Eating the same food They eat exactly the same everyday, except once a year, on Christmas day. Then the household members visit their family in the Netherlands and the two milk allergic nephews get their own sauces and desserts specially made for them. This does not bother them at all, because they were made to feel special.

4.3.5.4 Case study 5, Unit 5: Survey of aspects of the household

Food in the house

Bread, cereal and pasta Hagel flour, cake flour, rusks, ready-made pudding, puff pastry, baking powder, gelatine, custar, cocoa and maize flour

Vegetables Green pepper and broccoli

Fruits Fresh juice, raisins, cucumber, apples, bananas and mangoes, Tomato sauce, jam, canned mushrooms, canned fruit, tomato paste and chutney

Milk, yoghurt and cheese Smooth cheese, cheese, yoghurt, soy milk and powder milk

Meat, fish, poultry and dry beans Eggs, soy sauce and marmite

Fats, oils and sweets Margarine, mayonnaise, oil, sugar, chocolate topping, crips, jelly and peanut butter

Other Concentrated cooldrink, coffee, *Elgin tea*, tea, mustard, vinegar, spices, garlic sauce and coke.

A large selection of food is found in the house, including a variety of fresh products. Special provision is made for the allergic child by using soy milk.

The places where shopping is mostly done Pick 'n Pay, Spar and Fruit and Vegetable City are the most convenient to shop at for the caregiver.

The food budget per month The food budget is an estimated R2 000 per month for four people.

Special treats in the house for the children There are always some sweets from the Netherlands, as well as other sweets. Crisps and carbonated cooldrinks are also mostly available. They are not allowed to have some of this more than once a day.

The role recipes play in the household They have an estimated 35 recipe books in the house. The caregiver pages through them often, but she will only use a recipe once or so. Then she knows it and will improvise where necessary on her own. Her dad was a baker, so she grew up with baking and inherited some of the books from him.

4.3.5.5 Case study 5: General observations

The household looks well adapted to the situation. They have cow's milk allergy in the family, because both their children and a nephew are milk allergic. The whole household is staying free from milk and it is not a problem for anybody. The researcher does not think it is a real problem for them. They have accepted the situation and simple adjustments were made.

4.3.6 Case study 6

The researcher had problems when investigating this family. They are from another culture and background than the researcher and it felt as if special provision were made whenever the researcher came to visit. The allergic child was reluctant to talk to the researcher. She is an eight-year-old girl that lives with her parents. She has one brother but he is not living with them. The caregiver in the household is her father. The mother was the caregiver until two years ago, when the father developed a heart condition and retired early and the mother went to work. The child is allergic to wheat, but after a while the researcher discovered that they only omitted homemade bread and pastas from their diet. The household is still new in adapting to a wheat-free diet, because the child was only recently diagnosed.

4.3.6.1 Case study 6, Unit 1: Caregiver

Allergic child's background: eating habits since birth She is not a big eater – according to her parents she is too lazy to eat. When she was a very small girl, and they would put a plate of food in front of her, she would not eat. When she was fed, she ate quite eagerly. To a certain degree she always enjoyed vegetables and fruit, as well as fish and chicken, but not other types of meat. During early childhood she only had purity when they went to visits.

She adores her father, so whatever he eats she will also try. She likes stews and curry dishes. She eats rice on a daily basis and enjoys it very much.

Allergic child's background: time of diagnosis and change in life style She was diagnosed at the age of eight, being four months before the commencement of these field surveys. When this case study was conducted they were still very unsure of how to handle the food allergy. They only omitted homemade breads and pasta – meal items that in the past they in any case did not have often. Sometimes they omitted cake as well. They are not very precise on what to totally omit. They try but are not really dedicated. The child appears a bit spoiled and the researcher concluded they have difficulty restraining her from the food she likes.

Allergic child's background: symptoms of the child The caregiver said that the child's problem is that her upper lip swells and that she gets urticaria (this term was used during the diagnosis) over her whole body, but especially on her arms and back. The child said nothing about her skin condition but told the researcher in detail about her lip and that her eyes were swollen when she got up in the morning.

Allergic child's background: behavioural traits She is very shy when there are strangers. She is also very self-conscious of her lip and skin. She does not go to school the days that her symptoms are bad, because she is ashamed of her appearance. When she was in kindergarten, she was sometimes teased about her appearance, to such a degree that she started crying.

Feelings towards the allergic child He feels sorry for her, as though she is handicapped. Because she is so shy and being so ashamed of her appearance, she has no boldness to go out and play or talk to other people. Life passes her by. She was definitely affected socially due to the food allergy.

Perspective on the allergic child's feelings He feels she is extremely shy about it, he stated that she did not want to go with them to places where strangers will be, because she feels shy about her appearance. She

always carries a cloth with her and when her upper-lip swells, she covers her face with the cloth. This can lead to psycho-social problems (Mandell, Curtis, Gold & Hardie, 2002:95).

Perspectives on family cohesion In the house there is no problem with the family cohesion, because it is the only child of her parents, and they are very comfortable with each other. The caregiver will ask her before every meal what she would like to eat and then prepares that food. Mostly he and his wife will eat the same food or they will make other food for them.

Perspectives on meal planning and preparation The shopping is done once a month, mostly at Pick 'n Pay or Shoprite. The fresh products are bought as required. The night beforehand the wife defrosts the meat for the following day and then they discuss what will be on the menu the next day. The husband prepares the meal and they eat just after the wife gets back from work.

Perspectives on health consciousness of household members They try to be health conscious, but said it is not always possible. "Luckily" the allergic child does not like take-away foods so she never gets it, but she enjoys sweets. The treats they have for her in the house all contain wheat, they treat her with the things she is not allowed to eat. The treats are hot-cross buns, cocktail rolls and donuts.

Their food budget is very small, so they eat relative small amounts of fresh fruit and vegetables. They mostly eat stews or food in which all the ingredients are cooked together and the meat is extended by vegetables and potatoes to lower the cost.

Problems associated with food allergy When the child's symptoms occur suddenly and without warning, it is a big problem for them. Sometimes they are at a friends' house and her lips begin to swell. Usually they do not have medication with them. Then she gets upset because she looks "ugly" and insists that they go home. They are not yet in control of the situation and it appears as if they do not seek advice or support.

The biggest side effect of the food allergy is her shyness. She also does not socialise.

General tips He is still looking for tips because they just started to realise what the condition is.

4.3.6.2 Case study 6, Unit 2: Allergic child

The researcher had to probe her after most of the questions were asked, due to her shyness.

Feelings towards symptoms She hates being food allergic.

Difficulties of having a food allergy When the researcher probed on the issue of her symptoms she said that they were not so bad. She said that the worst was not being allowed to eat peanut clusters. The researcher found some contradiction here, because she was not diagnosed as being allergic to peanuts, yet they omitted that from her diet for "safety's sake", but they allowed her to eat bread that contains large amounts of wheat, the allergen that she is actually allergic to. Both her parents are worried about her reaction towards her symptoms, but they feed her the food responsible for the symptoms, while they omit other permitted food.

Things the child would like to have been different On this question, she had no answer, not even when the researcher probed.

Decision-making regarding permitted foods After her diagnosis she was not yet in the situation that she went somewhere without her parents. She generally asked them if she was allowed to eat the food. She is not a very social child and seldom went to visit friends, so the problem must still occur for the first time (probing was used).

Emotions of being allergic She said she is ashamed of her lip and skin and feels as if everybody stares at her bad skin and lip. She says she will rather not eat, than to tell people she is food-allergic.

4.3.6.3 Case study 6, Unit 3 and 4: Rest of house

Opinion on household's cohesion There is no problem with their family cohesion, because it is just the three of them and both her parents worry about her. They would do anything to help her. Out of their reaction is it obvious they do not know how to handle the situation.

When they are at home it is no problem, but when visiting friends it is a big issue. She does not want everybody to know she is food allergic, because then she feels the attention is on her, yet they must tell others, so that they will know what she is allowed to eat.

Problems encountered with having a food-allergic individual in the household Her shyness and difficulty with the handling of her symptoms are problems, which lead to an unbalanced social life. Another problem is that she cannot eat the food she really enjoys like pizza.

Strain put on the caregiver They omit grains totally from the cooking process, preparing food that she likes, and are allowed to eat. She has no reaction to Pick 'n Pay's bread so she still eats that whenever she is hungry and that helps a lot. The researcher concluded that they are still in the dark to assume that the wheat in Pick 'n Pay's bread is allowed. They think what really helps them is that it is only them in the house – no other children to take into account. Therefore they can easily make provision for her.

Eating the same food They try as far as possible to eat the same food, but sometimes she only wants rice with a sauce and then they prepare something else for themselves.

4.3.6.4 Case study 6, Unit 5: Survey of aspects of the household

Food in the house

Bread, cereal and pasta Pasta, bread and cake flour

Vegetables -

Fruits Cucumber and grapes, tomato paste, sweet corn, pineapple pieces, concentrated commercial lemon juice, apricot jam

Milk, yoghurt and cheese Milk, cheese spread and cheese

Meat, fish, poultry and dry beans Mussels, tuna, beans and eggs

Fats, oils and sweets Mayonnaise, oil, sugar, jelly and chocolate cocoa

Other Nesquick, tea, coffee, concentrated juice, iced tea, pepper, salt, spices and *Game*.

The food items they have in the house is quite expensive like the mussels and pineapple pieces. Therefore, they need to be educated on more effective ways to spend their money. They have no milk products in the house, products that are very important for young girls for normal bone development (Andon, Lloyd & Matkovic, 1994:141). It is also a known fact that South African children aged 1-9 years have a deficiency of calcium in the diet (Vitamin Information Center, 2001:4) which is addressed by milk in the diet. They had very little fresh products and both of them vegetables were green in colour - they need variety of colour as well as a variety of food in the diet, generally.

The places where shopping is mostly done They do all their shopping at Pick 'n Pay or Shoprite .

The food budget per month It is an estimated R500 per month for three people. It is very little, but they are (according to the LSM) still in the middle income group (groups 4-6).

Special treats in the house for the child There is not always something special in the house, but if the child wants something, a cafe is just at the end of their street and she can buy something there.

The role recipes play in the household They have about eight recipe books in the house, but only use them when preparing a special pasta dish or when they have difficulty preparing something. It appears as if they may have difficulty understanding the difference between corn/maize and wheat and therefore have difficulty in adapting to the restrictions of an allergic household when selecting permitted foods. They must rather try to avoid eating pasta if the child is wheat allergic.

4.3.6.5 Case study 6: General observations

The unannounced visit of the researcher totally upset them, so the researcher did not stay to eat with them. She only visited for 30 minutes and then left. They had tomato stew on rice that evening. The researcher again thinks it is a matter of the different cultural backgrounds and lack of social interaction between their own racial group and that of the white South Africans.

The allergic child is a very shy girl and her food-allergy symptoms definitely have an effect on her manner of socialising. Her parents are very caring and anything they can do for her they would. The household is still very new and uncertain in the process of eliminating and replacing grain products. According to the article of Mandell, Curtis, Gold and Hardie (2002:95) this family is typically in need of a lot of support. It is the responsibility of the physician who diagnosed the child as food allergic to help give information or recommend someone in a position to give support.

4.3.7 Case study 7

He is a seven-year-old boy that is allergic to egg and nuts. He lives with his parents and two sisters - respectively five and two years of age.

4.3.7.1 Case study 7, Unit 1: Caregiver

Allergic child's background: eating habits since birth He had a healthy appetite from the very first day and was born with eczema. The mother said the first thing she noted about her baby was his skin condition. He was never breast-fed due to problems on her side. To be safe the doctor prescribed soy milk for the baby.

The researcher could not find evidence why it was better to immediately put the baby on soy milk, rather than diluted cow's milk. He never enjoyed the soy milk, therefore she started feeding him soft foods at months. According to Chandra (2000: 273) the delayed introduction of solid food can limit proneness to food allergy. At nine months he was diagnosed for various allergens. When he was eighteen months he ate one peanut and got red all over and swollen. Ironically, at an early age when he was diagnosed for a variety of allergens, the medical team did not advise omission of peanuts from his diet. He had the condition at birth. So it is a moot point if breast-feeding could have improved his situation.

Allergic child's background: time of diagnosis and change in life style He was diagnosed at nine months and egg, cow's milk, wheat, fish, beef, peanuts and tomato were omitted from his diet. They tried to rebuild his immune system during this time. He was only allowed to eat chicken, lamb, fruit and vegetables. At two years of age, they re-introduced him to wheat again. At three years he again started eating fish and beef and then at three and a half years milk. He responded very positively to these foods. When he was four and a half years old, he accidentally ate cake in which there was egg. He immediately had a tight chest and his face got swollen.

Even if he just touched an egg he would react to it, anaphylactically. He is very fussy about his food. This past year he would sometimes consume food, which contained small amounts of egg in it, and be fine, but they are still very careful about the amount of egg he consumes. Peanuts are still totally omitted from his diet. He eats selectively and would not try something new.

Allergic child's background: symptoms of the child Eczema occurs all over his body whenever he gets in contact with egg. Sometimes he also gets a tight chest. When he was younger it was a bigger problem. According to the allergic child, he itches all over and then starts to turn red. These symptoms typically occur in food-allergic individuals (Steinman, 2002).

Allergic child's background: behavioural traits The caregiver does not think that being food allergic has a negative effect on the child. He is a first child so had nobody to compare himself with. He is not really troubled by the symptoms. According to her he is very reliable and independent so he checks everything before he eats it. She is sure the allergy has no negative effect on his psychological or social development. At an early age the caregiver supported the child as described by Mandell, Curtis, Gold and Hardie (2002:67). He learnt to handle the situation and is content.

Feelings towards the allergic child She said when he was small she really felt sorry for him because he was allowed only a limited variety of foods to eat. Now that he is older, he is permitted most foods and she does not feel that sorry for him anymore. He also showed that he could handle it. She said if he was a child that was less independent, she would have had a problem. However, she always stays scared that he may, without knowing, eat peanuts or a product containing peanuts and have a reaction.

Perspective on the allergic child's feelings The caregiver feels the child is fine with the situation. He has a strong back-up system at home and is a normal kid.

Perspectives on family cohesion There is no problem at all with family cohesion. The parents motivate and accommodate the allergic child as far as possible, without restricting the other children.

Family cohesion also improved since he has outgrown the major allergies. Until he was four and a half years, they never left him at someone. This had put a lot of stress on their marriage. The rest of the family is also scared to look after him, even now that he is much less sensitive. It definitely put restrictions on their family life.

Perspectives on meal planning and preparation Usually, the caregiver plans meals a day in advance. Otherwise she thinks about it just before she starts preparing the meal.

Perspectives on health consciousness of household members The caregiver thinks they are reasonably health conscious. The father promotes this a lot, he believes the children must be brought up with the right values and health consciousness is one of them.

Problems associated with food allergy The biggest problems according to the caregiver are, inter alia, eating out, visiting friends and sending the child on a camp or to friends.

She is scared that he would consume nuts and not know how to handle the situation or will not know how to get in touch with a medical team in time.

General tips Teach food-allergic children from the very beginning what they are permitted to eat, and teach them to implement it when they go out of the house as well.

4.3.7.2 Case study 7, Unit 2: Allergic child

Feelings towards symptoms He stated that his symptoms did not affect him.

Allergic child's feelings to food allergy in general Being food allergic really does not affect him, he carries on as normal.

Things the child would like to have been different He said, "Nothing, I am fine!"

Decision-making regarding permitted foods The allergic child usually asks if he is permitted to eat things. He knows which foods are allowed, so he has no problem, but whenever he is in doubt, he would ask someone.

Visiting other people He would usually keep quiet about his food allergy until they must eat and then he would mention it. If he is not permitted to eat the food, he just goes without it. He said he is used to it; it is not a problem for him not to eat.

Emotions of being allergic No he has very little emotions of being allergic. He just adjusted his life, due to a disease (probing was used). The researcher got the impression that it really did not bother him – he seemed relaxed, however, anxiety about his condition could repress his true feelings.

4.3.7.3 Case study 7, Unit 3 and 4: Rest of the family

The mother was asked to sit with the child that was interviewed. She was shy and not comfortable with the situation and it definitely helped to obtain data when she sat on her mother's lap. She is the smaller sister of the allergic child.

Opinion on household's cohesion They think the family's cohesion is good. They are a very close family. The father said he thought they might have such close relationships in the family due to the food allergy. He justified this statement by saying that after the allergic child's first anaphylactic reaction to peanuts, they were so scared to lose him that their values of what is important changed. The father said he values their family as the most important aspect of his life and would do anything for the family.

Problems encountered with having a food-allergic individual in the household Visiting friends and family, as well as eating out, is a problem. Sometimes he has noted that buying food can also be a problem, because they have to read every label.

Strain put on caregiver In the beginning it definitely was very difficult for the caregiver. She had to try her best to serve him a balanced meal. He said there was so little information on food allergies available for the public that they really had a hard time orientating themselves. This supports the findings of Mandell, Curtis, Gold and Hardie (2002:98) "nearly all of the parents reported that they had been given insufficient information at the time of diagnosis."

Eating the same food They eat the same at least 98% of the time. Only when they have French toast or scrambled egg, would they make something different for him.

4.3.7.4 Case study 7, Unit 5: Survey of aspects of the household

Food in the house

Bread, cereal and pasta *Weet-Bix*, Muesli, *Corn Flakes, Coco Pops*, pasta, rice, rusks, maize flour, cake flour , two-minute-noodles, soup, ice cream cones, cookies and self-rising flour

Vegetables -

Fruits Lettuce, tomatoes, carrots, green peppers, cucumber, apples, peaches, grapes, pineapple, tomato paste, canned peaches, canned granadilla, purity, lemon juice, concentrated fruit juices and gherkins

Milk, yoghurt and cheese UHT milk and ideal milk

Meat, fish, poultry and dry beans Eggs, mince mate and anchovies

Fats, oil, sweets oil, sweets, chips, chocolates, sugar, icing sugar, instant pudding and castor sugar

Other Concentrated cooldrinks, coffee, tea popcorn, salt, vanilla essence, caramelised milk, colourants, baking powder, Spices, marmite, mustard, vinegar and bicarbonate of soda, yeast

They had a wide variety of fresh products in the house.

The places where shopping is mostly done The shopping is mostly done at Pick 'n Pay but when something small is needed they buy it at Spar.

The food budget per month She estimated it at R1 500 per month for five people, although one is still a baby.

Special treats in the house for the children There are always a lot of special treats for the children. All the treats are usually egg-free so everyone can eat them. There are always sweets, chips, cookies and chocolates. She makes provision for the allergic child.

The role recipes play in the household Recipes play a very small role in the house. She has three to four recipe books. However, she very seldom consults them.

4.3.7.5 Case study 7: General observations

This household has adapted very well to the egg- and peanut-free life style they have. Everybody is trying hard to do his or her bit. When the researcher came unannounced to their house, they had pork chops with vegetable stir-fry, a greek salad and potatoes.

The researcher is under the impression that this family is happy and well adapted. She does not think they really find the allergic condition in the household difficult anymore.

4.4 CONCLUSIONS AND RECOMMENDATIONS

It appears as if the mothers, mostly caregivers, have the biggest influence on the allergic children's decision-making processes, choices of food and attitudes towards food. Mandell, Curtis, Gold and Hardie (2002:98) stated that the mother sees "herself as primarily responsible for the management of the child's safety". Therefore, educational programs on food allergies need to be focussed on the caregivers, normally mothers. As Yadrick and Sneed (1994:1122) stated, it appears as though, also here in South Africa, there is great need for educational programs on food allergies.

It also seems as if these people are all alone in their struggle to handle the food-allergic situation. This observation is substantiated by Mandell et al. (2002:65). Some of the participants pointed out that there is very little literature available on the practical issues of food allergies. Sicherer, Noone and Muñoz-Furlong (2001:464) also stated that further work must be done to raise awareness in schools, camps and restaurants. It seemed to be a problem in all the case studies when going to a restaurant or coffee shop. Socialising in general outside the house, was identified as a hazard and if educational or awareness programs can be launched it could be less of a problem. The study done by Baker and David (1997) confirms that eating out at a restaurant with a food-allergic child is extremely difficult.

An aspect that became apparent was the difficulty experienced by the researcher to conduct the case studies of participants with a different culture to her own. When visiting case study participants (two households) of a different culture, special preparations were made for the researcher and the normal situation in the house was adjusted. These children were more shy in the company of the researcher, and it was difficult to obtain reliable data from them. At times this made observations and discussions difficult. In these cases the researcher questioned the honesty with which they answered the questions. A possible solution is that a trained fieldworker of the same culture should investigate these participants.

When conducting this type of research, longer periods should be spent at each household. Two interviews should be conducted during one visit, thus limiting the number of appointments made at each of the households. Except for the time factor, the children would be more at ease in the company of the researcher. The child could then see the researcher - firstly talking to the mother, then maybe to the other children and in this way become at ease. (Each time the researcher visited the household in the way this research was conducted, the children had to get comfortable with the researcher all over again.)

It is very important that the participants should be enthusiastic and willing to cooperate. If this is not the case they get frustrated and irritated, because the research is time-consuming, and co-operation and sacrifices from the participants' side were required as well.

The extent to which results obtained via the case study technique can be generalised, is always a debatable issue. However, this does not mean that generalisations can not be made. The following generalisations were formulated from the units of analysis in Figure 4.1.

Children from Case Studies 1, 3 and 5 were **breast-fed**, although the child from Case Study 5 was only breast-fed for three months. The child from Case Study 7 was never breast-fed and already experienced food-allergic symptoms as a newborn baby. It appears as if most of the allergic children had a small appetite from the beginning, except the allergic child from Case Study 2, who developed the food allergy at a later stage in life.

Only the caregiver from Case Study 2 mentioned **socio-emotional problems**. The other caregivers all stated that everything was fine. However, there were uneasy situations. For example, embarresment with the symptoms, others respondents spoke about children being teased, and one respondent mentioned the fact that the child did not go to school when the symptoms were severe. Therefore, the researcher suspects that there is always some psychological effect. According to Erikson's well known theory on the eight stages in psychosocial development, children develop trust in the first year through support and provision of basic needs from others. If something is deprived from them the psychological outcome is a lack of trust (Craig, 1996:59). In their second and third year their independence and drive, or feelings of failure and shyness are established (Craig, 1996:59; Louw, 1995:54).

During the years in which allergic children develop their character, they have to struggle with issues of being different. All the food-allergic children from these case studies experience **being 'different'** although they sometimes put it in other words. In Case Study 1 the allergic boy stated that he disliked being food allergic because it prevented him 'from running fast' - and he immediately said – 'like the other children'. He compared himself to other children, which is normal, but he was different. The child from Case Study 2 felt like a burden while both children from Case Studies 1 and 2 knew they had some physical problems. Most of the food-allergic children stated that they felt different when everybody was eating something that they were not allowed to have.

The caregivers's feelings towards their allergic children are mostly the same. They all at one point felt sorry for the children and were sometimes worried about them, especially when visiting friends and family or socialising outside their house. This is closely related to their **biggest problems** - they all had the same type of problems. Firstly, letting the food-allergic children go to friends and socialising when eating out. Secondly, their symptoms are a problem, and thirdly they can not live spontaneously. "Households with food-allergic children must live with constant fear. The activities of daily life are potentially impacted by issues such as label reading of commercial food products, concerns for cross-contamination of food products in various settings and exposure that may occur in school, child care and social activities. These issues presumably affect the quality of life for these children and their families" (Sicherer, Noone & Munoz-Furlong, 2001:462). Caregivers and some of the household members in all the case studies were concerned about their allergic children, the child's exposure to allergens, and the childrens' quality of life.

The **caregiver's perspective on the allergic child's feelings** Most of them said they do not think it affected the allergic children, but the children from Case Studies 2 and 6 were, to some extent, psychologically affected. The caregivers in Case Studies 2 and 3 felt the restrictions put on the children were sometimes experienced as negative. Case Studies 3 and 6 were concerned about the children's reaction to the symptoms. The caregiver from Case Study 4 felt that the child had a problem when dealing with unknown situations or with strangers.

Sicherer, Noone and Muñoz-Furlong (2001:464) said because the diagnosis was clearly life-altering, it was crucial that the diagnosis be based on solid evidence, and that education and emergency preparedness be in place to provide a safe environment.

In all case studies it seems as if **family compliance** can be a big problem if care and extra attention are not given to it. Case Study 3 had a problem in the house and Case Studies 1 and 7 had problems with the relatives.

Most of the case studies also stated that they had problems with **food preparation** in the beginning, but they learned by trial and error. Case Studies 2 and 6 were still learning. **Meal planning** was a major problem and not standardised in any of the households. It appears as if the allergic child is mostly accommodated in the menu planning as far as possible, but sometimes received different food when the households treat themselves. However, food commodities for food preparation were not selected with care, and with the exception of one of the caregivers, the rest were more or less ignorent of hidden allergens in commercial household foods. The process of product scouting exposed the fact that common food commodities such as margarine, butter and mayonnaise contained wheat, soy, cow's milk and egg as hidden allergens – some were declared and others not (see Section 5.2.1.3). This contributed to the complexity of the problem.

Case Studies 2, 5 and 7 all read **food labels** but complained about the information available on labels. Hidden allergens on food labels were identified as aspects that were of great concern to the caregivers. None of them read food labels with confidence, a situation acknowledge by Joshi, Mofidi and Sicherer (2002:1019) and Altschul, Scherrer, Muñoz-Furlong and Sicherer (2001:468), while the researcher also exposed malpractice in declaring hidden allergens (see Section 5.2.1.3).

Most of the case studies really tried to be **health conscious** although they have trouble in knowing what it meant to be health conscious. A concise definition of health consciousness was difficult to derive from the literature. Only aspects of health consciousness (see Section 3.1) were identified from various research articles. Additionally, there appears ample room for educational programs focussing on optimum nutrition.

The **allergic children's feelings on their food allergy** were mostly the same. They said it did not bother them, but with further questioning they all mentioned the symptoms and disliked being restricted with regard to their food selection - although the degree to which it affected them differed.

The allergic child was mainly taught **decision making regarding permitted foods** by their mothers. This did not seem very succesful. Children from Case Studies 1, 3 and 4 reported that they would just eat anything, without asking, while children from Case Studies 2, 5 and 7 would rather stay without the food if they were in doubt.

The other parents, who are not the primary caregivers, all said that they are aware of the **difficulty experienced by the caregivers** in the beginning because they had to learn by trial and error. But they all said it became easier as they familiarised themselves with the situation.

The **food in the households** of the different case studies was common everyday food and not special or delicatessen foods. There was a variety of canned products and the households stocked the essential ingredients. If recipes were to be compiled for the two-week menu cycle (see Chapter 5), everyday ingredients should be used. The amount of food in the house, especially the fresh products, is strongly related to the food budget per month. Fresh fruit and vegetables were limited in households with a limited budget. This could be a misunderstanding of food value. The **role recipes play** in the household is apparently very small. Only the caregiver in Case Study 5 has a number of recipe books. None of the cases really used special recipes for the allergic child.

The availability of **special treats** for allergic children differed from household to household. Homes of Case Studies 2, 4, 5 and 7 mostly had something for the allergic children.

In general, the research entailing case studies was a success. This phase of the research verified the information that was obtained during the focus group meetings.

Empirical research questions that still needed to be addressed in future research included: (i) Whether there is a correlation between the severity of the food allergy (e.g anaphylaxis) and the discipline with which it is handled and (ii) Whether the socio-economic status influenced the discipline with which the food-allergic child is handled by the household members, especially the caregivers.

Developmental research could be done on educational programs addressing the issues above.

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CHAPTER 5: THE DEVELOPMENT OF TWO-WEEK MENU CYCLES FOR HOUSEHOLDS WITH CHILDREN ALLERGIC TO WHEAT, SOY, MILK AND EGG RESPECTIVELY

5.1 INTRODUCTION

According to Taylor, Hefle and Muñoz-Furlong (1999:19) "the only approach to the treatment of food allergies is through avoidance diets" hereby avoiding the relevant food protein(s). Suitable substitutes should be recommended (Clarke, McQueen, Samild & Swain, 1996:91). Taylor, Hefle and Muñoz-Furlong (1999:19) also mentioned "the construction and implementation of safe and effective avoidance diets are often a challenge for individuals with food allergies". Furthermore, in the study done by Baker and David (1997:46) they mentioned that avoidance diets could place severe constraints on the social life and nutrient intake, particularly likely if the person has been given deficient information.

Two key areas of research can be acknowledged based on existing trends related to recipe and menu development: product development and consumer acceptability. There is a demand for food products that meet specific nutritional characteristics such as allergen-free products. As the nutritional characteristics of recipes are adjusted changes in properties such as flavour, texture and colour can occur. Consumer acceptability of these products will determine their success on the market (Sneed & Gregoire, 1995:23). Another trend at the moment is the need for convenience foods that are easy to prepare and not time consuming (Sloan, 1999:42-43; McMahon & Cameron, 1998:19).

After the focus group meetings and case studies were conducted it was clear that very few participants really used recipes and that the real issue for households with food-allergic children was not the development of allergen-free recipes (see Section 3.3.1.3 and Section 4.4). Instead, these households that has to cope with food allergies are not sure about the correct selection of food appropriate for their needs. They do not understand the concept of allergies and hidden allergens and have difficulty planning and preparing balanced meals that are free from the specific allergens that can be enjoyed by everybody in the household (see Section 3.3.1.2).

The main goal that followed was therefore to develop two-week menu cycles for the households with children allergic to wheat, soy, cow's milk and egg respectively, that meet their needs.

The following terms are considered relevant for this chapter, namely hidden allergens, menu cycle, recipes and adapted recipes. **Hidden allergens** is the unwitting exposure to allergens, occurring through ingestion, inhalation, breast feeding and skin contact (Steinman, 2002), for example gluten, farina and semolina for the wheat-allergic child; protein, MSG and HVP for the soy-allergic child, casein, cheese and lactose for the milk-allergic child and albumin, emulsifier and binder for the egg-allergic child (Department of Health, 2002:56-57); **Menu cycle** is a carefully planned series of menus that offer different items from day to day for a specific period of time, after which the menus are repeated (Spears, 1995:148; Swanepoel, Loubser & Visser, 1992:31); **Recipes** are a list of (*ingredients and* (SM)) instructions for preparing or cooking food (Hawkins, 1996:364) and **Adapted recipes** are existing recipes that are changed/modified to fulfil in the required needs of the two-week menu cycle and because of copyright issues.

5.2 METHODOLOGY

In order to develop two-week menu cycles for households with children allergic to wheat, soy, cow's milk and egg respectively, basic criteria were developed for the selection of the recipes. Additionally to these criteria the two-week menu cycles were also compiled to meet a combination of criteria from (i) the quantitative USDA Food Guide Pyramid (ii) the qualitative Food-Based Dietary Guidelines and (iii) from a table developed with common nutritional problems allergic children encounter. The data obtained from the focus group meetings and case studies as well as current trends were considered. These criteria set the scene for nutritional adequacy of the daily meal plans as well as for the two-week menu cycle. In Chapter 6 the quantitative nutritional assessment of one the menu cycles will be reported (see Section 6.3) making use of the Recommended Dietary Allowance and taking Dietary Goals into consideration.

The USDA Food Guide Pyramid is a quantitative educational tool, and has become the most widely distributed and best-recognised nutrition educational tool (Nestlé, 1998:198). It was decided to use the USDA Food Guide Pyramid, because all the Pyramids, whether the Asian, Mediterranean or Vegetarian, are based on the same building blocks, namely grains, vegetables and fruit (Smolin & Grosvenor, 2000:A171-A173). The similarities in the different pyramids are more dominant than are the differences (Kennedy, 1998:184).

The USDA Food Guide Pyramid links an individual's nutritional needs, the dietary guidelines, and usual food patterns (Kennedy, 1998:183). The Food Guide Pyramid is not a rigid prescription of what people must eat but rather a general guide for healthy eating. It is based on three essential concepts: balance, variety and moderation (Kennedy, 1998:183). A SA pyramid that is authentic and good is not available (Mrs S. De Villiers, Personal communication, 12 September 2002) and in the educational settings modifications of the USDA Food Guide Pyramid have been used. The USDA Food Guide Pyramid also has some problems but are acknowledge by most nutritionists. The South African Five Food Groups was considered but there is controversy whether it should be divided into three, five or seven groups (Dr Petro Wolmarans, Personal communication, 5 August 2002).

The basis of the Food Guide Pyramid is the Bread, Cereal and Pasta Group with 6-11 servings, followed by the second level containing the Vegetable Group with 3-5 servings and the Fruit Group with 2-4 servings. On the third level are the Milk, Yoghurt and Cheese Group and the Meat, Poultry, Fish, Dry Beans, Eggs and Nuts Group with both 2-3 servings. At the top of the pyramid is the Fats, Oils and Sweets Group containing foods to be used sparingly (Neslte, 1998:189-197; Kennedy, 1998:183-188; Wolmarans & Oosthuizen, 2001:S48) (see Figure 2.1, Section 2.6.1.1.5).

On the other hand is the qualitative Food-Based Dietary Guidelines, with similarities to the USDA Food Guide Pyramid. Both the qualitative and quantitative tools are food-based. The Food-Based Dietary Guidelines is a broad set of guidelines to help consumers to have a healthy eating pattern. Food-Based Dietary Guidelines for consumers older than 7 was used because the Food-Based Dietary Guidelines for children were still being finalised (Lesley Borne, Personal communication, Co-developer of Food-Based Dietary Guidelines for children, 13 May 2002). These guidelines are: (i) enjoy a variety of foods, (ii) be active, (iii) make starchy foods the basis of most meals, (iv) eat plenty of fruits and vegetables every day, (v) eat dry beans, peas, lentils and soy regularly, (vi) meat, fish, chicken, milk or eggs can be eaten every day,

(vii) eat fats sparingly, (viii) use salt sparingly, (ix) drink lots of clean, safe water and (x) if you drink alcohol, drink sensibly (Love, Maunder, Green, Ross, Smale-Lovely & Charlton, 2001:9).

5.2.1 Preliminary study

The preliminary study was conducted in three phases, namely (i) the formulation of basic criteria for the development of the two-week menu cycles, (ii) identification of common nutritional problems of food-allergic children and (iii) product scouting for convenience food.

5.2.1.1 Basic criteria for the development of the two-week menu cycles

The two-week menu cycles firstly had to meet basic criteria, which aided in the selection of recipes for the two-week menu cycles. As guidelines for these basic criteria, aspects identified by the developers of the Food-Based Dietary Guidelines (Love *et al.*, 2001) was adapted, as well as the data obtained from the focus group meetings and case studies (Section 3.3 and Section 4.4). The basic criteria were the following: (i) the whole family, including the allergic child, should be able to follow the two-week menu cycle and it should meet their nutritionally needs; (ii) recipes used in the two-week menu cycle should contain health-promoting ingredients and be nutritionally balanced (the following served as qualitative and quantitative guides, namely Food-Based Dietary Guidelines and the USDA Food Guide Pyramid); (iii) the two-week menu cycles should address the problems usually found in the diets of food-allergic children; (iv) the recipes should be affordable by the middle-income consumer; (v) ingredients used should be easily available to the consumer and (vi) recipes should address the shortcomings of the diets of focus group members.

Criterium one will be addressed in Chapter 6, while criteria two, four, five and six were addressed in previous chapters. In the following section criterium three will be discussed.

5.2.1.2 Common nutritional problems of food-allergic children

In order to address the third criterion nutritional problems of children with the respective allergies were identified. A table was developed for discussion with six experts in the field of nutrition regarding the nutrition for the food-allergic child. The experts completed the table individually and afterwards they discussed the results with the researcher. The data from all the experts were tabulated (see Table 5.1). This table helped the researcher to further identify the problems associated with the development of recipes for specific allergies, namely wheat, soy, cow's milk and egg, which could cause problems for these individuals. These problems identified by the experts were addressed in the development of the two-week menu cycle.

TABLE 5.1: COMMON NUTRITIONAL PROBLEMS IDENTIFIED BY NUTRITIONAL EXPERTS

Allergy	Problems to be addressed in the menu cycle.	Problem areas in the field	Propositions
Cow's milk	Limited calcium levels of diet leads to the question of supplementation. Should pharmaceutical products be used for supplementation, or should the salts be included in menu-dishes? If the diet/dishes were supplemented what is a suitable source of calcium?	Bio-availability of salt for supplementation are issues, e.g. $CaCO_3$, $CaCl_2$ and calcium-lactinate.	Addition of suitable salts. Enriched soy milk addition or other foods containing calcium.
	Cow's milk is present in many additives and food ingredients, therefore a serious hidden allergen.	Inadequate labelling and/or ignorance when reading labels.	Teach consumers to read labels. Labelling law must be finalised as Annexure 8 of this law clearly lists hidden wheat protein allergens.
Wheat	Inadequate energy intake leads to weight loss. Substitutes for breads/baked goods are scarce. Variation in diet is limited. Levels of fibre and the B-Vitamins, especially thiamin, riboflavin and niacin intake, are low.	Grains are main energy source and children dislike substitutes like rice cakes, muesli, Rye-vita and wheat-free products, when eaten regularly.	Add other permitted cereals/grains to diet. Investigate wheat-free bread and other breakfast options, e.g. wheat-free muesli, as wheat plays an important role in breakfast. Add more fruit and vegetables to diet.
	Wheat is present in many additives and food ingredients, therefore a serious hidden allergen.	Inadequate labelling and/or ignorance when reading labels.	Teach consumers to read labels. Labelling law must be finalised as Annexure 8 of this law clearly lists hidden milk protein allergens.
Soy	Soy is present in many additives and food ingredients, therefore a serious hidden allergen.	Inadequate labelling and/or ignorance when reading labels.	Teach consumers to read labels. Labelling law must be finalised as Annexure 8 of this law clearly lists hidden soy protein allergens.
	Soy is an important source of protein, however, soy milk is unpalatable.		Animal proteins are more expensive.
Egg	Egg is present in many additives and food ingredients, therefore a serious hidden allergen.	Inadequate labelling and/or ignorance when reading labels.	Teach consumers to read labels. Labelling law must be finalised as Annexure 8 of this law clearly lists hidden egg protein allergens.
	Important protein source.		Other animal proteins are more expensive.

5.2.1.3 Product scouting

Currently, one of the top ten trends of the food market is convenience and simplicity of foods (Sloan, 1999:42-43; McMahon & Cameron, 1998:19). In the development of the two-week menu cycles care was taken to make it simpler on the caregiver. Therefore product scouting was done at the following shops due to convenience, namely *Checkers, Nature's Way Health Shop* and *Spar* from 17 July to 7 August 2002 on

processed foods on the lowest level of the USDA Food Guide Pyramid, namely the Breads, Cereal, Rice and Pasta Group and selectively on the higher groups, to determine the presence of allergens in these products, so that the caregiver does not have to prepare these foods from scratch, but will be able to buy convenience products commercially available in this group. The selected products were chosen for the following reasons, namely they were often seen in households during the case studies, they offered excellent alternatives to conventional menu items because of convenience, or thirdly they were basic food ingredients often used in recipe development (see Section 5.5).

The list of hidden allergens for the proteins in wheat, milk, soy and egg according to Annexure 8 of the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2002:74-75) was used to identify hidden allergens on the product labels. It is assumed that these labels will be accurate concerning declaration of hidden allergens. However, the practice is still not flawless and the absence of hidden allergens is not guaranteed (Altschul, Scherrer, Muñoz-Furlong & Sicherer, 2001:468).

Products that the researcher investigated for hidden allergens were commercial breads (see Addendum 12A), garlic loaves and pizza bases (see Addendum 12B), breakfast cereals (see Addendum 12C) and pasta products (see Addendum 12D). These products are usually easier to buy than to prepare in the traditional method at home and were chosen because of convenience. Each of the respective Addenda evaluated each hidden allergen for the four protein types separately.

After having done this, it was possible to list the permitted products from this selection and Table 5.2 summarises the products from the Breads, Cereal, Rice and Pasta Group that can be eaten by the children allergic to wheat, soy, milk and egg respectively. The product scouting of commercial breads, garlic loaves, pizza bases, breakfast cereals and pasta products indicated that the households with **wheat-allergic children** could buy limited commercial products from the basis of the USDA Food Guide Pyramid. From the bread investigated there are only two types that can be eaten by the allergic child (although health shops do have wheat-free bread - not included in the product scouting because they have no food label). None of the investigated commercial garlic loaves and pizza bases suited the requirements of the wheat-allergic consumer. The caregiver will have to steer clear from these types of convenience products on the market. There are quite a number of permitted breakfast cereals for the wheat-allergic child. All oats porridges are safe, as well as all the varieties of *Pronutro*. There are a number of commercial pasta products available that are wheat-free, but they are mostly to be found in health shops. Care must be taken when the labels are read.

The product scouting for hidden soy allergens showed that **soy-allergic children** have a variety of commercial products that they are allowed to eat from the Bread, Cereal and Pasta Group of the USDA Food Guide Pyramid. However, care must be taken when bread is bought. Some bread contains hidden allergens and they are products that are easily associated with soy allergens. None of the commercial garlic loaves, pizza bases, or pasta products that were investigated contained soy allergens. The breakfast cereals that contain soy allergens are limited, but *Pronutro* products from *Bokomo* should be avoided. Therefore, the household with a soy-allergic child can easily buy breakfast cereals. The labels, however, should be read in order to detect the main and hidden allergens.

TABLE 5.2: COMMERCIAL PRODUCTS SUITABLE FOR THE CHILD ALLERGIC TO WHEAT, SOY, COW'S MILK AND EGG RESPECTIVELY.

	Wheat	Soy	Cow's milk	Egg
COMMERCIAL PRODUCTS	**Bread** *French Connection VitaRye+-, French Connection Oldenburger Dark Rye.* **Breakfast cereals** *Bokomo Maltabella, Bokomo Kreemy Meel, Bokomo Oats, Jungle Oats, Tiger Oats, Nature's Source Choc Bitz, Bokomo Pronutro Original, Bokomo Pronutro Chocolate, Bokomo Pronutro Strawberry, Bokomo Pronutro Banana, Bokomo Rice Crispies.* **Pasta** *The Original Pasta Regalo Gluten-free Spaghetti, The Original Pasta Regalo Gluten-free Butternut, The Original Pasta Regalo Gluten-free Lasagne, The Original Pasta Regalo Gluten-free Fettuccine, The Original Pasta Regalo Wheat-free Chilli, The Original Pasta Regalo Wheat-free Mushroom, The Original Pasta Regalo Wheat-free Shells, The Original Pasta Regalo Wheat-free Tagliatelle, The Original Pasta Regalo Wheat-free Beetroot.*	**Bread** *Sasko Sam White Bread enriched, Sasko Dumpey, Sasko Boland Traditional Whole-wheat, Sasko Boland Traditional White, Uncle Salie's Home-made Whole-wheat, Duens Brown, Blue Ribbon Brown, Blue Ribbon Toaster, Duens Brown bread, French Connection VitaRye+-, French Connection Rheinische Roggenschnitten, French Connection Oldenburger Dark Rye.* **Garlic loaves and pizzas** *Papa's Bakery Garlic Bread, Griddles "roosterkoek" plain, Griddles "roosterkoek" herb, Griddles Plain Pizza, Mighty Meal Today Tomato Pizza Base, Julies Genuine Italian Pizza, Hal Pizza.* **Breakfast cereals** *Bokomo Maltabella, Bokomo Kreemy Meel, Bokomo Oats, Bokomo Corn Flakes, Bokomo Rice Crispies, Kellogg's Wheat Bix, Kellogg's Netrifixx, Kellogg's Rice Crispies, Kellogg's Frosties, Kellogg's Chocos, Kellogg's Strawberry Pops, Kellogg's All Bran Flakes, Kellogg's Special K, Kellogg's High-fibre Bran, Kellogg's Corn Flakes, Nature's Source Choc Bitz, Jungle Oats, Tiger Oats, Taystee Wheat* **Pasta** *Fatti's & Moni's Shells, Fatti's & Moni's Macaroni, Fatti's & Moni's Gnocci, Fatti's & Moni's Fusilli, Fatti's & Moni's Fusilli Tricolone, Fatti's & Moni's Lasagne, Fatti's & Moni's Mix Screws, Mr Pasta Macaroni, Mr Pasta Spaghetti, Monteverde Shells, Monteverde Fartalla, Monteverde Fusilli, Monteverde Linguine, Monteverde Spaghetti, Monteverde Macaroni, The Original Pasta Regalo Gluten-free Spaghetti, The Original Pasta Regalo Gluten-free Butternut, The Original Pasta Regalo Gluten-free Lasagne, The Original Pasta Regalo Gluten-free Fettuccine, The Original Pasta Regalo Wheat-free Chilli, The Original Pasta Regalo Wheat-free Mushroom, The Original Pasta Regalo Wheat-free Shells, The Original Pasta Regalo Wheat-free Tagliatelle, The Original Pasta Regalo Beetroot.*	**Bread** *Sasko Sam White Bread, Sasko Sam Whole-wheat, Sasko Sam Whole-wheat, Sasko Sam White Bread enriched, Sasko Dumpey, Sasko Boland Traditional Whole-wheat, Sasko Boland Traditional White, Sasko Swartland Oats & Honey, Sasko Swartland Rye & Honey, Uncle Salie's Traditional, Uncle Salie's Home-made Whole-wheat, Duens Dumpey, Duens Brown, Blue Ribbon Brown, Blue Ribbon Toaster, Blue Ribbon Super, Duens Brown bread, Albany Bakeries Superior, Albany Bakeries Brown, French Connection VitaRye+-, French Connection Rheinische Roggenschnitten, French Connection Oldenburger Dark Rye.* **Garlic loaves and pizzas** *Papa's Bakery Garlic Bread, Griddles Plain Pizza, Mighty Meal Today Tomato Pizza Base, Julies Genuine Italian Pizza, Hal Pizza.* **Breakfast cereals** *Bokomo Maltabella, Bokomo Kreemy Meel, Bokomo Oats, Bokomo Corn Flakes, Bokomo Rice Crispies, Bokomo Wheat Bix, Kellogg's Netrifix, Kellogg's Rice Crispies, Kellogg's Frosties, Kellogg's Chocos, Kellogg's Strawberry Pops, Kellogg's All Bran Flakes, Kellogg's High-fibre Bran, Kellogg's Corn Flakes, Jungle Oats, Tiger Oats, Taystee Wheat.* **Pasta** *Fatti's & Moni's Shells, Fatti's & Moni's Macaroni, Fatti's & Moni's Gnocci, Fatti's & Moni's Fusilli, Fatti's Moni's Fusilli Tricolone, Fatti's & Moni's Lasagne, Fatti's & Moni's Mix Screws, Mr Pasta Macaroni, Mr Pasta Screws, Mr Pasta Spaghetti, Monteverde Shells, Monteverde Fartalla, Monteverde Fusilli, Monteverde Linguine, Monteverde Spaghetti, Monteverde Macaroni, Barilla Lasagne, The Original Pasta Regalo Gluten-free Spaghetti, The Original Pasta Regalo Gluten-free Butternut, The Original Pasta Regalo Gluten-free Lasagne, The Original Pasta Regalo Gluten-free Fettuccine, The Original Pasta Regalo Wheat-free Chilli, The Original Pasta Regalo Wheat-free Mushroom, The Original Pasta Regalo Wheat-free Shells, The Original Pasta Regalo Wheat-free Tagliatelle, The Original Pasta Regalo Wheat-free Beetroot.*	**Bread** *Sasko Sam White Bread, Sasko Sam Whole-wheat, Sasko Sam White Bread enriched, Sasko Dumpey, Sasko Boland Traditional Whole-wheat, Sasko Boland Traditional White, Sasko Daybreaker Brown Bread, Sasko Daybreaker Brown Toaster, Sasko Swartland Oats & Honey, Sasko Swartland Rye & Honey, Uncle Salie's Traditional, Uncle Salie's Home-made Whole-wheat, Duens Dumpey, Duens Brown, Blue Ribbon Brown, French Connection VitaRye+-, French Connection Rheinische Roggenschnitten French Connection Oldenburger Dark Rye.* **Garlic loaves and pizzas** *Papa's Bakery Garlic Bread, Griddles Plain Pizza, Mighty Meal Today Tomato Pizza Base, Julies Genuine Italian Pizza, Hal Pizza.* **Breakfast cereals** *Bokomo Maltabella, Bokomo Kreemy Meel, Bokomo Oats, Bokomo Pronutro Whole Wheat, Bokomo Pronutro Original, Bokomo Pronutro Chocolate, Bokomo Pronutro Banana, Bokomo Pronutro Strawberry, Bokomo Corn Flakes, Bokomo Rice Crispies, Bokomo Wheat Bix, Kellogg's Netrifixx, Kellogg's Rice Crispies, Kellogg's Frosties, Kellogg's Chocos, Kellogg's Strawberry Pops, Kellogg's All Bran Flakes, Kellogg's Special K, Kellogg's High-fibre Bran, Kellogg's Corn Flakes, Nature's Source Choc Bitz, Jungle Oats, Tiger Oats, Taystee Wheat.* **Pasta** *Fatti's & Moni's Shells, Fatti's & Moni's Macaroni, Fatti's & Moni's Gnocci, Fatti's & Moni's Fusilli, Fatti's & Moni's Fusilli Tricolone, Fatti's & Moni's Lasagne, Fatti's & Moni's Mix Screws, Mr Pasta Macaroni, Mr Pasta Spaghetti, Monteverde Shells, Monteverde Fartalla, Monteverde Fusilli, Monteverde Linguine, Monteverde Spaghetti, Monteverde Macaroni, The Original Pasta Regalo Gluten-free Spaghetti, The Original Pasta Regalo Gluten-free Butternut, The Original Pasta Regalo Gluten-free Lasagne, The Original Pasta Regalo Gluten-free Fettuccine, The Original Pasta Regalo Wheat-free Chilli, The Original Pasta Regalo Wheat-free Mushroom, The Original Pasta Regalo Wheat-free Shells, The Original Pasta Regalo Wheat-free Tagliatelle, The Original Pasta Regalo Beetroot.*

The product scouting of the products in the Breads, Cereal, Rice and Pasta Group proved that most products were free from allergens of milk and egg. With the exception of two loaves of bread, the **cow's milk-allergic children** can eat all the bread. The two *Griddles "roosterkoek"* (plain and herb) contain milk allergens. Some of the breakfast cereals contain hidden allergens for the milk-allergic child, e.g. *Bokomo's Pronutro* products, but as with the soy-allergic child, there are a number of other cereals that are permitted. None of the pasta products contain any hidden allergens for the milk-allergic child.

For **egg-allergic children** there is a large number of permitted bread types. The two *Griddles "roosterkoek"* however, contain hidden egg allergens. None of the commercial pasta products or breakfast cereals contain any hidden egg allergens.

At the highest level of the USDA Food Guide Pyramid margarine was found commonly in households. These products contain both milk and soy allergens. In some cases the source of possible hidden allergens was nor specified (see Table 5.3A).

TABLE 5.3A: HIDDEN ALLERGENS (SPECIFIED AND NOT SPECIFIED) IN SELECTED MARGARINE PRODUCTS AND SPREADS

Selected products	Hidden allergens			Allergen, source unspecified
	Soy	Cow's milk	Egg	
Flora Light	-	-	-	Lecithin
Flora pro-activ	-	Buttermilk	-	Thickener, Emulsifiers
Rama	Emulsifiers	Milk solids	-	
Stork	Lecithin	Milk solids	-	Emulsifiers
Blossom Canola	-	Milk solids	-	Emulsifiers
Clover Butro (butter spread)*	-	Cream, milk solids	-	Emulsifiers were not listed as an ingredient

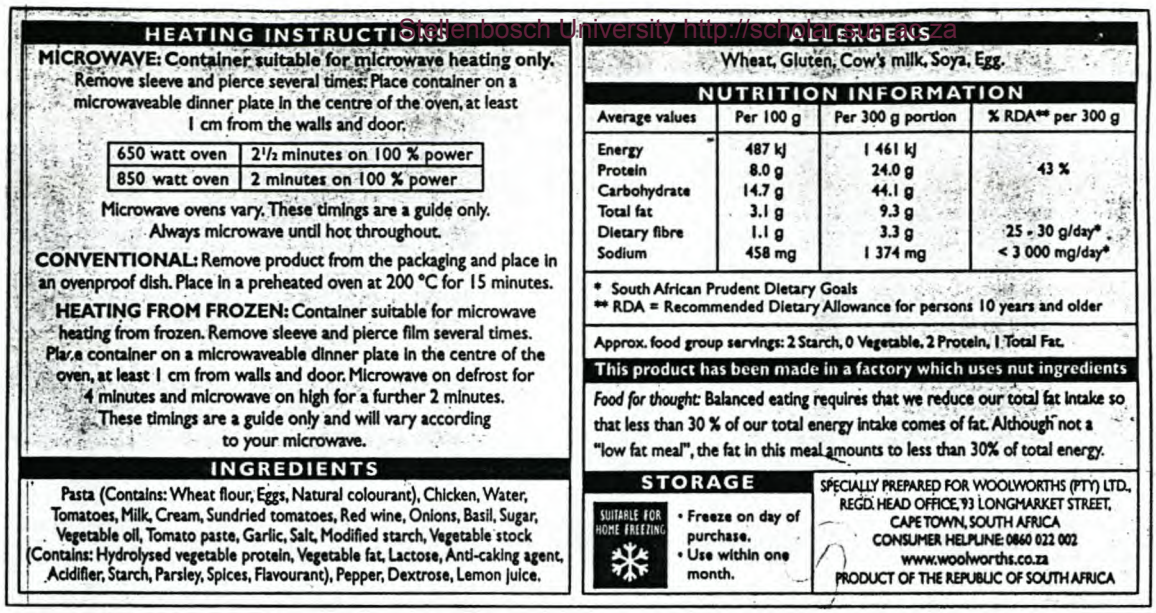
- Cream and vegetable oil are the two main ingredients.

In the selected products investigated, some of the allergen sources were specified on the label, for example the label of *Rama* specified that the emulsifiers used in *Rama* have a soy protein origin, while the emulsifiers used in *Stork* are not specified and can therefore contain either soy or egg proteins.

Two food labels are compared in Figure 5.1 and Figure 5.2. The food label in Figure 5.1 of a mayonnaise does not specify the main or hidden allergens in the ingredients list, the origin of the stabilisers and emulsifier are unknown, while Figure 5.2 also does not specify the allergens but made a special heading declaring all the allergens in the dish.

Ingredients: Water, vinegar, sunflower oil (10,5%), modified maize starch, sucrose, mustard flour, sodium chloride, lemon juice, citric acid, sodium saccharin (non-nutritive sweetener (0,02%)), spices, stabilisers, emulsifier, colourant. Preserved with potassium sorbate.

FIGURE 5.1 INAPPROPRIATE FOOD LABEL



HEATING INSTRUCTIONS

MICROWAVE: Container suitable for microwave heating only. Remove sleeve and pierce several times. Place container on a microwaveable dinner plate in the centre of the oven, at least 1 cm from the walls and door.

650 watt oven	2½ minutes on 100 % power
850 watt oven	2 minutes on 100 % power

Microwave ovens vary. These timings are a guide only. Always microwave until hot throughout.

CONVENTIONAL: Remove product from the packaging and place in an ovenproof dish. Place in a preheated oven at 200 °C for 15 minutes.

HEATING FROM FROZEN: Container suitable for microwave heating from frozen. Remove sleeve and pierce film several times. Place container on a microwaveable dinner plate in the centre of the oven, at least 1 cm from walls and door. Microwave on defrost for 4 minutes and microwave on high for a further 2 minutes. These timings are a guide only and will vary according to your microwave.

INGREDIENTS

Pasta (Contains: Wheat flour, Eggs, Natural colourant), Chicken, Water, Tomatoes, Milk, Cream, Sundried tomatoes, Red wine, Onions, Basil, Sugar, Vegetable oil, Tomato paste, Garlic, Salt, Modified starch, Vegetable stock (Contains: Hydrolysed vegetable protein, Vegetable fat, Lactose, Anti-caking agent, Acidifier, Starch, Parsley, Spices, Flavourant), Pepper, Dextrose, Lemon juice.

ALLERGENS

Wheat, Gluten, Cow's milk, Soya, Egg.

NUTRITION INFORMATION

Average values	Per 100 g	Per 300 g portion	% RDA** per 300 g
Energy	487 kJ	1 461 kJ	
Protein	8.0 g	24.0 g	43 %
Carbohydrate	14.7 g	44.1 g	
Total fat	3.1 g	9.3 g	
Dietary fibre	1.1 g	3.3 g	25 - 30 g/day*
Sodium	458 mg	1 374 mg	< 3 000 mg/day*

* South African Prudent Dietary Goals
** RDA = Recommended Dietary Allowance for persons 10 years and older

Approx. food group servings: 2 Starch, 0 Vegetable, 2 Protein, 1 Total Fat.

This product has been made in a factory which uses nut ingredients

Food for thought: Balanced eating requires that we reduce our total fat intake so that less than 30 % of our total energy intake comes of fat. Although not a "low fat meal", the fat in this meal amounts to less than 30% of total energy.

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FIGURE 5.2 APPROPRIATE FOOD LABEL

The following selected items from the other groups of the Food Guide Pyramid (see Table 5.3B) were investigated for hidden allergens, namely mayonnaise, tomato sauce, marmite and yoghurt because they were so commonly found in the households (see Section 4.3).

TABLE 5.3B: COMMERCIAL PRODUCTS SUITABLE FOR CHILD ALLERGIC TO WHEAT, SOY, MILK AND EGG RESPECTIVELY

	Wheat	Soy	Cow's milk	Egg
Suitable Products	**Mayonnaise** *Koo, Nola, Kraft, Crosse & Blackwell, Hellman's Real* and *Hellman's Lite.* **Tomato Sauce** *Heinz Tomato Ketchup, All Gold Tomato Sauce, All Gold Hot and Spicy, Wellington's Tomato Sauce, Master Foods, Safari Tomato Sauce.* ***Marmite*** **Yoghurt** *Clover, Gero, Darling, Parmalat* and *Dairy Belle.*	**Tomato Sauce** *Heinz Tomato Ketchup, All Gold Tomato Sauce, All Gold Hot and Spicy, Wellington's Tomato Sauce, Master Foods, Safari Tomato Sauce.* ***Marmite.***	**Mayonnaise** *Koo, Nola, Kraft, Crosse & Blackwell, Hellman's Real, Hellman's Lite.* **Tomato Sauce** *Heinz Tomato Ketchup, All Gold Tomato Sauce, All Gold Hot and Spicy, Wellington's Tomato Sauce, Master Foods* and *Safari Tomato Sauce.* ***Marmite.***	**Tomato Sauce** *Heinz Tomato Ketchup, All Gold Tomato Sauce, All Gold Hot and Spicy, Wellington's Tomato Sauce, Master Foods, Safari Tomato Sauce.* ***Marmite*** **Yoghurt** *Clover, Gero, Darling, Parmalat, Dairy Belle.*

Marmite and the tomato sauce varieties contain no hidden allergens for any of the four groups of allergic children, while all the different brand names of mayonnaise contain main or hidden allergens for the children allergic to egg- and soy, and all the yoghurts contain hidden allergens for the children allergic to milk and soy. Therefore, these children must be careful to eat any yoghurt (see Addenda 13E and F). All these products (and possibly the products in Table 5.2, but this was not established) may however, contain additives to which individuals may be intolerant (Steinman, 2002). As these additives must, according to the draft legislation, be declared on the label it was possible to identify them during product scouting (see Table 5.3C). Once more it is assumed that all these products had the preservatives declared on labels (although undeclared preservatives may be present (Joshi, Mofidi & Sicherer, 2002:1019)).

TABLE.5.3C: COMMERCIAL PRODUCTS CONTAINING PRESERVATIVES, MSG AND TARTRAZINE

	Preservatives	MSG	Tartrazine
Yoghurt:		-	-
Clover	potassium sorbate	-	-
Gero	sodium cyclamate	-	-
Darling	pimaricin	-	-
Parmalat	sorbic acid	-	-
Dairy Belle	pimaricin	-	-
Tomato sauce:		-	-
Heinz	-	-	-
All Gold	-	-	-
All Gold Hot	-	-	-
All Gold Spicy	-	-	-
Wellington's	sulphur dioxide, sodium benzoate	-	-
Safari	sodium benzoate	-	-
Mayonnaise:		-	-
KOO	potassium sorbate	-	-
Kraft	potassium sorbate	-	-
Nola	potassium sorbate	-	-
Crosse & Blackwell	potassium sorbate	-	-
Hellman's Real	potassium sorbate	-	-
Marmite	-	-	-

From Table 5.3C it is clear that *marmite* contained no preservatives, while the yoghurts all contain various preservatives. Some of the varieties of tomato sauces declared the presence of preservatives, others did not mentioned any. At the same it will be useful to establish if all the tomato sauce varieties claiming not to contain preservatives are actually preservativ-free. All the mayonnaise brand names investigated contained potassium sorbate. None of the investigated products contained MSG or Tartrazine. Depending on the intolerance care must be taken with preservatives, MSG and Tartrazine as allergic individuals may also be intolerant to these additives, and may not even be aware of the particular intolerance. According to Taylor, Hefle and Muñoz-Furlong (1999:20) the precise tolerance for allergenic foods has not been investigated carefully. However, the seriousness of these preservatives, MSG and Tartrazine are not yet known (Dr. H Steinman, Personal communication, 2002).

5.2.2 Main study

The goals of the main study were to developed two-week menu cycles for the children allergic to wheat, soy, cow's milk and egg, respectively and to compose the recipes for the menu cycles.

5.2.2.1 Development of two-week menu cycles

The two-week menu cycles were developed to fit into the life style of the participants in the case studies and focus groups. The researcher developed the main meals in the two-week menu cycle for supper, but the participants were free to interchange lunch and supper. It was also decided to develop the menu for three main meals per day.

In the focus group meetings and case studies it did not seem as if the selection of an appropriate snack was a problem for the allergic children (Sections 3.3 and 4.4). Most of the participants in the case studies snacked a slice of bread in the late afternoon. Mostly the wheat-allergic children snacked fruit or rice cakes. The menu cycles are ideal for either spring or autumn, but the households can easily also use them at another time (see Tables 5.5 - 5.8). The assuption was made when the menu cycles were developed that all the family members would eat all the meals at home, allthough it is idealistic to think that it would always be followed correctly by all the households. Furthermore, was the phenomenon of cross-reactions and multiple allergies not largely considered due to limitations of the study. The development of the **two-week menu cycles** was done by the procedure described by Swanepoel, Loubser and Visser (1992:32-34). The same recipes were used for all four two-week menu cycles - different substitutes were used for different allergens. Firstly, all the main menu items for the entire dinner cycle were selected (see Table 5.4A).

TABLE 5.4A: MAIN MENU ITEMS FOR DINNER

Day	Wheat-free	Soy-free	Cow's milk-free	Egg-free
1	Lemon and Rosemary chicken*	Lemon and Rosemary chicken*	Lemon and Rosemary chicken*	Lemon and Rosemary chicken*
2	Bobotie*	Bobotie*	Bobotie*	Bobotie*
3	Grilled chicken kebabs*	Grilled chicken kebabs*	Grilled chicken kebabs*	Grilled chicken kebabs*
4	Vegetarian lasagne*	Vegetarian lasagne*	Vegetarian lasagne*	Vegetarian lasagne*
5	Green bean with onion and bacon dish*	Green bean with onion and bacon dish*	Green bean with onion and bacon dish*	Green bean with onion and bacon dish*
6	Kabeljou*	Kabeljou*	Kabeljou*	Kabeljou*
7	Sesame seed chicken*#	Sesame seed chicken*	Sesame seed chicken*	Sesame seed chicken*
8	Roast rack of lamb*	Roast rack of lamb*	Roast rack of lamb*	Roast rack of lamb*
9	Spaghetti Bolognaise*	Spaghetti Bolognaise*	Spaghetti Bolognaise*	Spaghetti Bolognaise*
10	Chicken stir-fry*	Chicken stir-fry*	Chicken stir-fry*	Chicken stir-fry*
11	Pan-fried fish*	Pan-fried fish*	Pan-fried fish*	Pan-fried fish*
12	"Crumbed" lamb chops*	Crumbed lamb chops*	Crumbed lamb chops*	Crumbed lamb chops*
13	Apricot chicken*	Apricot chicken*	Apricot chicken*	Apricot chicken*
14	Pasta*	Pasta*	Pasta*	Pasta*

* The same recipes, but adapted with replacements. # More consumer are developing an allergic reaction to sesame seeds.

These are the most expensive items on the menu and cost can be controlled largely through careful planning. These items were mainly derived from the Meat, Fish, Poultry and Dry Bean Group of the USDA Food Guide Pyramid. At the same time it was very effective to control the amount of servings of the Meat, Poultry, Fish, Dry Beans, Eggs and Nuts Group.

After selecting the main menu items for dinner, for the complete menu cycle, the main menu items for lunch were selected (see Table 5.4B). These items were mainly derived from the Meat, Fish, Poultry and Dry Bean Group and the Bread, Cereal and Pasta Group, though food from the Fruits, Vegetables and Milk, Yoghurt and Cheese Groups were also included.

TABLE 5.4B: MAIN MENU ITEMS FOR LUNCH

Day	Wheat-free	Soy-free	Cow's milk-free	Egg-free
1	"Melkkos" *	"Melkkos" *	"Melkkos" *	"Melkkos" *
2	Chickpea dish*	Chickpea dish*	Chickpea dish*	Chickpea dish*
3	Stuffed potato*	Stuffed potato*	Stuffed potato*	Stuffed potato*
4	Spinach and mango salad*	Spinach and mango salad*	Spinach and mango salad*	Spinach and mango salad*
5	Stuffed ham slices	Pizza*	Stuffed ham slices	Pizza*
6	Rice salad	Couscous salad*	Couscous salad*	Couscous salad*
7	Butternut soup	Butternut soup	Butternut soup	Butternut soup
8	Pasta salad*	Pasta salad*	Pasta salad*	Pasta salad*
9	Asparagus dish*	Asparagus dish*	Asparagus dish*	Asparagus dish*
10	Canneloni*	Canneloni*	Canneloni*	Canneloni*
11	Broccoli chowder*	Broccoli chowder*	Broccoli chowder*	Broccoli chowder*
12	Potato fritters	Stuffed pancakes	Stuffed pancakes	Stuffed pancakes
13	Spinach quiche*	Spinach quiche*	Spinach quiche*	Spinach quiche*
14	Omelette*	Omelette*	Omelette*	Sandwich

* The same recipes, but adapted with replacements.

After the main menu items for dinner and lunch were selected the items for breakfast were selected (see Table 5.4C). These items were mainly selected from the Bread, Cereal and Pasta Group, the Milk, Yoghurt and Cheese Group as well as the Fruits Group. There is less variation in the breakfast items, due to a restriction on time in the mornings.

Having selected the main menu items for the three meals the remaining items required from the Bread, Cereal, Rice and Pasta Group were allocated to dinner, lunch and breakfast - in that order. Thereafter items required from the Vegetables Group and Fruits Group were divided between the three meals.

The households must take care when selecting convenience foods, for example commercial products such as breakfast cereals and loaves of bread for the two-week menu cycle. Even when purchasing convenience foods, such as margarine and yoghurt for recipe dishes, care should be taken by reading labels to ensure that they are free from allergens, as established by the product scouting (see Section 5.1.2.3).

TABLE 5.4C: MAIN MENU ITEMS FOR BREAKFAST

Day	Wheat-free	Soy-free	Cow's milk-free	Egg-free
1	Fruit salad & yoghurt	Fruit salad & yoghurt	Fruit salad	Fruit salad & yoghurt
2	Boiled egg & cheese	Boiled egg & cheese	Boiled egg	Tomato & cheese sandwich
3	Breakfast cereal*	Breakfast cereal*	Breakfast cereal*	Breakfast cereal*
4	Sausage on bread*	Sausage on bread*	Sausage on bread*	Sausage on bread*
5	Fruit salad & yoghurt	Fruit salad & yoghurt	Fruit salad	Fruit salad & yoghurt
6	Boiled egg & cheese	Boiled egg & cheese	Boiled egg	Tomato & cheese sandwich
7	Banana muffin*	Banana muffin*	Banana muffin*	Banana muffin*
8	Oats porridge*	Oats porridge*	Oats porridge*	Oats porridge*
9	Sorghum porridge*	Sorghum porridge*	Sorghum porridge*	Sorghum porridge*
10	Breakfast cereal*	Breakfast cereal*	Breakfast cereal*	Breakfast cereal*
11	Muesli*	Muesli*	Muesli*	Muesli*
12	Mealie meal*	Mealie meal*	Mealie meal*	Mealie meal*
13	Sandwich*	Sandwich*	Sandwich*	Sandwich*
14	Breakfast cereal*	Breakfast cereal*	Breakfast cereal*	Breakfast cereal*

- The same recipes, but adapted with replacements.

After the menu cycles were developed they were evaluated for colour, texture and variety requirements. The entire day was checked vertically on the menu form for adequacy in all aspects for each day, and horizontally for duplication and repetition – a method proposed by Swanepoel, Loubser and Visser (1992:34). Whether this requirement was met was cross-checked by a food expert (Mrs. A Dalton, Department of Consumer Science (Foods), University of Stellenbosch). Afterwards some adjustments were made.

The daily meal plans were also provisionally evaluated for nutritional adequacy using the USDA Food Guide Pyramid (see Table 5.5), but it became very clear that this was an inadequate procedure. Menu items contain ingredients out of more than one group and this resulted in estimations of nutritional adequacy.

TABLE 5.5: THE EVALUATION OF MENU PLAN DAY TWO IN THE TWO-WEEK MENU CYCLE FOR THE CHILD ALLERGIC TO WHEAT (example)

	USDA Food Guide Pyramid groups					
	Breads, cereals and Pasta (6-11 servings)	**Fruits** (2-4 servings)	**Vegetables** (3-5 servings)	**Milk, Yoghurt and cheese** (2-3 servings)	**Meat, Fish, Poultry, Dry beans, Egg and Nuts** (2-3 servings)	**Fats, oils and sweets** (sparingly)
Breakfast						
boiled egg	-	-	-	-	1	-
cheese	-	-	-	0.5	-	-
bread	1	-	-	-	-	-
fruit juice	-	1	-	-	-	-
Lunch						
chickpea dish	-	-	2	-	1	-
Mid afternoon snack						
bread with jam	1	-	-	-	-	0.5
Supper						
bobotie	0.5	-	1.5	1	1.5	1
brown rice	1	-	-	-	-	-
stewed peaches	-	1	-	-	-	-
Greek salad	-	0.5	0.5	-	-	-
Total	3.5	2.5	4	1.5	3.5	1.5

5.2.2.2 Development of recipes

The recipes for the two-week menu cycles were selected from recipe books and adapted in view of various allergens as well as for purposes of copyright on published recipes. Functional foods were added (see Section 2.6.1.1.7) and the allergens omitted and replaced by suitable substitutes. Ten books for recipes were used: 1) Du Plessis, 2001; 2) *Food Allergy Network*, 2000; 3) *Food Allergy Network*, 1999; 4) Hall, 1991; 5) Human, 1985; 6) Lategan, 1997; 7) Lategan, 2000; 8) Myburg, 2000; 9) Reader's Digest, 1990 and 10) *Woolworths. Chicken recipes,* while recipe developmental work at the Department of Consumer Science (Pienaar and Proos) was also used. The sources of the original recipe are indicated on the two-week menu cycles with a superscript number. As far as possible the same substitutes for specific allergens were used - those readily available - to make it easier on the caregiver and to have to buy only one "speciality" food.

For some of the menu items it was difficult to find published recipes, e.g. the green salad and oats porridge. In these cases the researcher developed the recipes. As far as possible every-day recipes were chosen - easy to prepare and containing ingredients commonly found in most households (Sections 3.3.1.3 and 4.4). The cost of the recipes and the amount of time taken to prepare the recipes were considered in the selection of recipes. In the cases where specific ingredients of the recipes were adapted, the reason for the adaptation

was given. Because percentage composition is affected by these replacements they were not accommodated in the percentage formulation and are stated as options (see Figure 5.3).

A work procedure was developed for the recipes. All the recipes were converted from *household units* into *grams* and then *percentage compositions* of the ingredients were calculated. This was done for both the original and the adapted recipes, where applicable, and tabulated next to each other in Addendum 10. Percentage compositions will promote the sizing down or up of the recipes as required for households and aided in the determination of portion sizes in gram (used in Chapter 6). *Microsoft Excel* was used for the calculations of the percentage compositions. The American and South African measuring units differ to such a slight degree that they were regarded as negligible.

The recipes were arranged in order of selection, meaning firstly that all the main menu items for dinner from day one to fourteen are given (see Addendum 10A), then lunch (see Addendum 10B) and thereafter breakfast menu items (see Addendum 10C) respectively. The ingredients of the recipes were arranged in order of use, where the order was relevant. The recipes of the two-week menu cycles will be integrated into the software program of *Allergy Advisor*© (Steinman, 2002) (see Addendum 11) and was also drawn up to meet the criteria of this format. The example of a recipe for *Allergy Advisor* in Addendum 12 contains the household units, but Addendum 10 is for academic reporting and only contains metric units.

The recipes in Addendum 10 all had the same information (see Figure 5.3), namely (i) the recipe name, (ii) recipe source, (iii) number of servings (yield), (iv) the list of ingredients with their metric units and percentage compositions, (v) total yield (based on original recipe) corresponding 100%, (vi) the method, (v) reason for recipe adaption. The recipes were focussed the **milk-allergic** child. Suggestions were made for replacements where applicable in the various recipes (reported in Section 5.3) for the children with wheat, soy and egg allergies.

Some ingredients posed problems, for example, when potato flour had to replace cake flour for the wheat-allergic child, these two flours have slightly different densities. However, these masses were made equal. This made conversions by *Microsoft Excel* possible. Butter and margarine were replaced in all the recipes by oil, due to the possible presence of especially milk and soy allergens, established through informal product scouting (see Table 5.3A). The process of product scouting was informally done due the enormous variety of products on the market. The caregivers were free to select their own type of oil. Both butter and margarine give better texture to baked products. Therefore, the households with children allergic to wheat and egg are free to use butter. The following spices were regarded as basic spices for households and were included in the recipes, namely cinnamon, turmeric, bay leaves, ginger, coriander and cumin. These are also functional foods. The use of fresh herbs are strongly advocated and were also included, in view of their flavour and nutraceutical/functional attributes (see Section 2.2.2.5).

The assumption was made that when food loses water during cooking, the nutrients stay the same, but when food absorb water during cooking the water had to be taken into account because the mass of the food and the nutrient density per mass differs considerably. For example, all pasta products and rice absorb water. The amount of water absorbed was not the same as the amount of water use for cooking. In these cases the rice and pasta products (known raw mass) were cooked, and the absorbtion of water was determined by weighing (the scale used was electronic Mettler PJ6000). In the cases where the liquid became part of the dish (e.g. porridge, sago pudding) the water is clearly stated in the recipe. The amounts of water absorbed

or lost by fruit and vegetables were ignored, due to the negligible small amounts. It was assumed that such loses or gains will not effect nutritional value significantly.

Bobotie (Human, 1984:112). Serves 4-6 (Casserole dish = 1,5 *L*)

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
white bread slices, thick	30.0	2.6%	30.0	3.1%	Wheat-allergic child use *French Connection Vita Rye.*
milk/soy milk	250.0	21.4%	250.0	25.8%	The cow's milk allergic child uses soy milk; the soy-allergic child must use the
onion, grated	100.0	8.6%	100.0	10.3%	
oil	22.0	1.9%	22.0	2.3%	
lemon juice	37.5	3.2%	37.5	3.9%	
curry powder	5.0	0.4%	5.0	0.5%	
sugar	4.0	0.3%	4.0	0.4%	
salt	4.0	0.3%	4.0	0.4%	
pepper	2.0	0.2%	2.0	0.2%	
mince meat	500.0	42.8%	500.0	51.7%	
eggs	200.0	17.1%	0.0	0.0%	See replacements below for egg-allergic child.
chutney	10.0	0.9%	10.0	1.0%	
lemon leaves (optional)	3.0	0.3%	3.0	0.3%	
Total	1167.5	100.0%	967.5	100.0%	

Method:

Fry the onions and mince in oil until brown.
Mix the lemon juice, curry powder, sugar, chutney, salt and pepper and add to onions-mince mixture.
Soak bread in milk. Press most of the milk from bread, but keep the remaining milk.
Blend the bread until fine. Add to the mixture.
Preheat the oven to 180°C. Grease the 1,5 *L* oven-pan with oil.
Put the mixture into the casserole.
Beat the egg and milk together and season. Pour over the mince base.
Press the lemon leaves into the bobotie.
Bake for 30 min and serves hot.

Replacement: for **egg-allergic** child:

Replace 200 g egg with 70 g smooth cottage cheese, 130 g thin white sauce, adding the remaining milk (see above) to the sauce.
Pour over meat base in casserole, etc.

FIGURE 5.3: EXAMPLE OF RECIPE ADAPTION AND FORMAT AS IN ADDENDUM 10A

Due to the demand for foods to be offered at parties and other social events (see Sections 3.3.1.4 and 4.4; Stevens & Stoner, 1978:276 & Willingham, 2001:56), the researcher decided to include some additional recipes that focused on this specific need for snacks and party foods. They included egg-less chocolate cake, chocolate cup cakes, sago pudding and vegetable tofu smoothie.

5.3 RESULTS AND DISCUSSIONS

The goal of this phase of the research was to developed four two-week menu cycles for the households with children allergic to wheat, soy, cow's milk and egg respectively and to compile the accompanying recipes. The menu cycles developed for the households with children allergic to wheat, soy, cow's milk and egg are summarised in Tables 5.5 - 5.8 respectively. The menu items where allergens were omitted from the original recipe and replaced by other ingredients are shaded in grey on the menu cycles. The same recipes were used for all four allergies and a permitted foodstuff replaced the allergens per allergy.

TABLE 5.5: TWO-WEEK MENU CYCLE FOR THE HOUSEHOLD OF THE WHEAT-ALLERGIC CHILD.

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Breakfast	Fruit salad & yoghurt Avocado pear on wholewheat bread Coffee/tea	Egg, tomato & cheese on wholewheat bread [6] Coffee/tea/fruit juice	Grain-free breakfast cereal with milk Fruit Coffee/tea	Sausage, tomato & cheese on whole-wheat bread [6] Coffee/tea/fruit juice	Fruit salad & yoghurt [1] Coffee/tea	Boiled egg, tomato & cheese on whole-wheat bread [6] Fruit Coffee/tea	Potato muffins [6] cheese & jam Fruit Coffee/tea
Lunch	Tapioca "Melkkos" with cinnamon [6] Coffee/tea/fruit juice	Warm spiced chickpea dish [4] Coffee/tea/fruit juice	Mushroom, cheese & garlic potato Coffee/tea/fruit juice	Spinach & mango salad [3] Coffee/tea/fruit juice	Stuffed slices of ham Coffee/tea/fruit juice	Pasta ratatoille salad Coffee/tea/fruit juice	Butternut soup [7] with wholewheat bread [6] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Lemon & rosemary chicken [11] Penne pasta tossed in olive oil Mixed vegetables [7] Green salad Coffee/tea/fruit juice	Bobotie [5] Brown rice Stewed peaches Greek salad Coffee/tea/fruit juice	Grilled chicken kebabs with granolata [8] Green salad Carrots julienne Cottage cheese on Wholewheat bread [6] Coffee/tea/fruit juice	Vegetarian lasagne [7] Greek salad Coffee/tea/fruit juice	Green bean, onion and bacon dish [10] Coffee/tea/fruit juice	Kabeljou, mushrooms & sour cream [4] Potato wedges Sugar peas Tomato & basil salad Coffee/tea/fruit juice	Sesame seed chicken [6] Sweet potatoes with ginger & lemon Grilled vegetables Garden salad Coffee/tea/fruit juice
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Breakfast	Oats porridge, & honey Fruit Coffee/tea	Sorghum porridge, and sugar Fruit Coffee/tea	Breakfast cereal & milk Fruit Coffee/tea	Yoghurt & muesli [9] Coffee/tea	Mealy meal , and honey Fruit yoghurt Coffee/tea	Toasted sandwich on whole-wheat bread [2] Fruit Coffee/tea	Breakfast cereals & milk Mixed fruit salad Coffee/tea
Lunch	Pasta salad [10] with whole-wheat bread [6] Coffee/tea/fruit juice	Asparagus dish [5] Coffee/tea/fruit juice	Canneloni with spinach & ricotta cheese [7] Coffee/tea/fruit juice	Broccoli soup [10] Whole-wheat bread [6] Coffee/tea/fruit juice	Stuffed pancakes [6] Coffee/tea/fruit juice	Spinach quiche [3] Green salad Coffee/tea/fruit juice	Omelet Whole-wheat bread [6] and tomato [7] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Roast rack of lamb with crust [1] Jacket potatoes Baked aubergine [7] Cucumber and feta salad Coffee/tea/fruit juice	Spaghetti Bolognaise [6] Parsley loaf [3] Green salad Coffee/tea/fruit juice	Chicken stir-fry Lentil and brown rice Coffee/tea/fruit juice	Pan-fried fish & lemon butter sauce [10] Mashed potatoes Carrot & pineapple salad Cucumber & tomato salad Coffee/tea/fruit juice	"Crumbed" lamb chops with herbs [4] Basmati rice Ginger, honey carrots Coleslaw [10] Coffee/tea/fruit juice	Apricot chicken [5] Baby marrow White rice Coffee/tea/fruit juice	Bacon, mushroom walnuts pasta Green salad Coffee/tea/fruit juice

TABLE 5.6: TWO-WEEK MENU CYCLE FOR THE HOUSEHOLD OF THE SOY-ALLERGIC CHILD.

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Breakfast	Fruit salad and yoghurt Avocado pear on wholewheat bread Coffee/tea	Egg, tomato & cheese on wholewheat bread [b] Coffee/tea/fruit juice	Breakfast cereal with milk Coffee/tea	Sausage, tomato & cheese on whole-wheat bread [b] Coffee/tea/fruit juice	Fruit salad & yoghurt Coffee/tea	Boiled egg, tomato & cheese on whole-wheat bread [b] Fruit Coffee/tea	Carrot & apple muffins [6] with cheese and jam Fruit Coffee/tea
Lunch	Tapioca "Melkkos" with cinnamon [b] Coffee/tea/fruit juice	Warm spiced chickpea dish [4] Coffee/tea/fruit juice	Mushroom, cheese & garlic potato Coffee/tea/fruit juice	Spinach & mango salad [3] Coffee/tea/fruit juice	Pizza [3] Coffee/tea/fruit juice	Couscous ratatoille salad Coffee/tea/fruit juice	Butternut soup [7] with wholewheat bread [b] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Lemon & rosemary chicken [11] Penne pasta tossed in olive oil Mixed vegetables [7] Green salad Coffee/tea/fruit juice	Bobotie [5] Brown rice Stewed peaches Greek salad Coffee/tea/fruit juice	Grilled chicken kebabs with granolata [8] Green salad Carrots julienne Cottage cheese on Wholewheat bread [b] Coffee/tea/fruit juice	Vegetarian lasagne [7] Greek salad Coffee/tea/fruit juice	Green bean, onion and bacon dish [10] Coffee/tea/fruit juice	Kabeljou, mushrooms and sour cream [4] Potato wedges Sugar peas Tomato & basil salad Coffee/tea/fruit juice	Sesame seed chicken [6] Sweet potatoes with ginger & lemon Grilled vegetables Garden salad Coffee/tea/fruit juice
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Breakfast	Oats porridge, milk & honey Fruit Coffee/tea	Sorghum porridge, and sugar Fruit Coffee/tea	Breakfast cereal & milk Fruit Coffee/tea	Yoghurt & muesli [9] Coffee/tea	Mealy meal with milk and honey Fruit yoghurt Coffee/tea	Toasted sandwich Fruit Coffee/tea	Breakfast cereals & milk Mixed fruit salad Coffee/tea
Lunch	Pasta salad [10] with whole-wheat bread [6] Coffee/tea/fruit juice	Asparagus dish [3] Coffee/tea/fruit juice	Canneloni with spinach & ricotta cheese [7] Coffee/tea/fruit juice	Broccoli soup [10] Whole-wheat bread [6] Coffee/tea/fruit juice	Stuffed pancakes [6] Coffee/tea/fruit juice	Spinach quiche [3] Green salad Coffee/tea/fruit juice	Omelet Whole-wheat bread [7] and tomato Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Roast rack of lamb with crust [1] Jacket potatoes Baked aubergine [7] Cucumber and feta salad Coffee/tea/fruit juice	Spaghetti Bolognaise [6] Parsley loaf [3] Green salad Coffee/tea/fruit juice	Chicken stir-fry Lentil and brown rice Coffee/tea/fruit juice	Panfried fish with lemon butter sauce [10] Mashed potatoes Carrot & pineapple salad Cucumber & tomato salad Coffee/tea/fruit juice	Crumbed lamb chops with herbs [4] Basmati rice Ginger, honey carrots Coleslaw [10] Coffee/tea/fruit juice	Apricot chicken [5] Baby marrow White rice Coffee/tea/fruit juice	Bacon, Mushroom and walnuts pasta Green salad Coffee/tea/fruit juice

TABLE 5.7: TWO-WEEK MENU CYCLE FOR THE HOUSEHOLD OF THE MILK-ALLERGIC CHILD.

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Breakfast	Fruit salad and yoghurt Avocado pear on wholewheat bread Coffee/tea	Egg, tomato & cheese on wholewheat bread [6] Coffee/tea/fruit juice	Grain-free breakfast cereal with milk Coffee/tea	Sausage & tomato & cheese on whole-wheat bread [6] Coffee/tea/fruit juice	Fruit salad & yoghurt [1] Coffee/tea	Boiled egg with tomato & cheese on whole-wheat bread [6] Coffee/tea	Carrot & apple muffins [6] with jam Fruit Coffee/tea
Lunch	Tapioca "Melkkos" with cinnamon [6] Coffee/tea/fruit juice	Warm spiced chickpea dish [4] Coffee/tea/fruit juice	Mushroom, cheese and garlic potato Coffee/tea/fruit juice	Spinach & mango salad [3] Coffee/tea/fruit juice	Stuffed slices of ham Coffee/tea/fruit juice	Couscous ratatoille salad Coffee/tea/fruit juice	Butternut soup [7] with wholewheat bread [6] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Lemon & rosemary chicken [11] Penne pasta tossed in olive oil Mixed vegetables [7] Green salad Coffee/tea/fruit juice	Bobotie [5] Brown rice Stewed peaches Greek salad Coffee/tea/fruit juice	Grilled chicken kebabs with granolata [8] Green salad Carrots julienne Cottage cheese on Wholewheat bread [6] Coffee/tea/fruit juice	Vegetarian lasagne [7] Greek salad Coffee/tea/fruit juice	Green bean, onion and bacon dish [10] Coffee/tea/fruit juice	Kabeljou, mushrooms and sour cream [4] Potato wedges Sugar peas Tomato & basil salad Coffee/tea/fruit juice	Sesame seed chicken [6] Sweet potatoes with ginger & lemon Grilled vegetables Garden salad Coffee/tea/fruit juice
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Breakfast	Oats porridge, & honey Fruit Coffee/tea	Sorghum porridge, and sugar Fruit Coffee/tea	Breakfast cereal & milk with soy milk Fruit Coffee/tea	Yoghurt & muesli [9] Coffee/tea	Mealy meal with soya and honey Fruit yoghurt Coffee/tea	Toasted sandwich bread slice Fruit Coffee/tea	Breakfast cereals & milk Mixed fruit salad Coffee/tea
Lunch	Pasta salad [10] with whole-wheat bread [6] Coffee/tea/fruit juice	Asparagus dish [5] Coffee/tea/fruit juice	Canneloni with spinach & ricotta cheese [7] Coffee/tea/fruit juice	Broccoli soup [10] Whole-wheat bread [6] Coffee/tea/fruit juice	Stuffed pancakes [6] Coffee/tea/fruit juice	Spinach quiche [3] Green salad Coffee/tea/fruit juice	Omelet Whole-wheat bread [6] and tomato [7] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Roast rack of lamb with crust [1] Jacket potatoes Baked aubergine [7] Cucumber and feta salad Coffee/tea/fruit juice	Spaghetti Bolognaise [5] Parsley loaf [3] Green salad Coffee/tea/fruit juice	Chicken stir-fry Lentil and brown rice Coffee/tea/fruit juice	Panfried fish with lemon butter sauce [10] Mashed potatoes Carrot & pineapple salad Cucumber & tomato salad Coffee/tea/fruit juice	Crumbed lamb chops with herbs [4] Basmati rice Ginger, honey carrots Coleslaw [10] Coffee/tea/fruit juice	Apricot chicken [5] Baby marrow White rice Coffee/tea/fruit juice	Bacon, Mushroom and walnuts pasta Green salad Coffee/tea/fruit juice

TABLE 5.8: TWO-WEEK MENU CYCLE FOR THE HOUSEHOLD OF THE EGG-ALLERGIC CHILD.

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Breakfast	Fruit salad and yoghurt Avocado pear on wholewheat bread Coffee/tea	Tomato & cheese on wholewheat bread [6] Coffee/tea/fruit juice	Breakfast cereal cereal with milk Coffee/tea	Sausage, tomato & cheese on whole-wheat bread [6] Coffee/tea/fruit juice	Fruit salad & yoghurt Coffee/tea	Whole-wheat bread & cheese on whole-wheat bread [6] Fruit Coffee/tea	Carrot & apple muffins [6] with cheese and jam Fruit Coffee/tea
Lunch	Tapioca "Melkkos" with cinnamon [6] Coffee/tea/fruit juice	Warm spiced chickpea dish [4] Coffee/tea/fruit juice	Mushroom, cheese garlic potato Coffee/tea/fruit juice	Spinach and mango salad [3] Coffee/tea/fruit juice	Pizza [3] Coffee/tea/fruit juice	Couscous vegetable ratatoille salad Coffee/tea/fruit juice	Butternut soup [7] with wholewheat bread [6] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Lemon and rosemary chicken [11] Penne pasta tossed in olive oil Mixed vegetables [7] Green salad Coffee/tea/fruit juice	Bobotie [5] Brown rice Stewed peaches Greek salad Coffee/tea/fruit juice	Grilled chicken kebabs with granolata [8] Green salad Carrots julienne Cottage cheese on Wholewheat bread [6] Coffee/tea/fruit juice	Vegetarian lasagne [7] Greek salad Coffee/tea/fruit juice	Green bean with onion and bacon dish [10] Coffee/tea/fruit juice	Kabeljou with mush- and sour cream [4] Potato wedges Sugar peas Tomato & basil salad Coffee/tea/fruit juice	Sesame seed chicken [6] Sweet potatoes with ginger & lemon Grilled vegetables Garden salad Coffee/tea/fruit juice
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Breakfast	Oats porridge with milk & honey Fruit Coffee/tea	Sorghum porridge, and sugar Fruit Coffee/tea	Breakfast cereal & milk with milk Fruit Coffee/tea	Yoghurt & muesli [9] Coffee/tea	Mealy meal with and honey Fruit yoghurt Coffee/tea	Toasted sandwich Fruit Coffee/tea	Breakfast cereals & milk Mixed fruit salad Coffee/tea
Lunch	Pasta salad [10] with whole-wheat bread [6] Coffee/tea/fruit juice	Asparagus dish [3] Coffee/tea/fruit juice	Canneloni with spinach & ricotta cheese [7] Coffee/tea/fruit juice	Broccoli soup [10] Whole-wheat bread [6] Coffee/tea/fruit juice	Stuffed pancakes [6] Coffee/tea/fruit juice	Spinach quiche [3] Green salad Coffee/tea/fruit juice	Whole-wheat bread [6] and tomato [7] Coffee/tea/fruit juice
Snack	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread	Slice of bread
Supper	Roast rack of lamb with crust [1] Jacket potatoes Baked aubergine [7] Cucumber and feta salad Coffee/tea/fruit juice	Spaghetti Bolognaise [6] Parsley loaf [3] Green salad Coffee/tea/fruit juice	Chicken stir-fry Lentil and brown rice Coffee/tea/fruit juice	Pan-fried fish with lemon butter sauce [10] Mashed potatoes Carrot & pineapple salad Cucumber and tomato salad Coffee/tea/fruit juice	Crumbed lamb chops with herbs [4] Basmati rice Ginger, honey carrots Coleslaw [10] Coffee/tea/fruit juice	Apricot chicken [5] Baby marrow White rice Coffee/tea/fruit juice	Bacon, mushroom & walnuts pasta Green salad Coffee/tea/fruit juice

When the two-week menu cycles were developed, recipes that already contained limited number of the respective wheat, soy, cow's milk and egg allergens were selected or ingredient options to accommodate the children with the respective allergies. Therefore, it may appear as if few recipe changes were made. This ensures that the allergic child does not feel different by eating the same food as the rest of the household (Willingham, 2000:85,107; Stevens & Stoner, 1979:11). Such a two-week menu cycle suits everybody's needs and it demonstrates that "everyday" food can be served in a household with a food-allergic child, without much difficulty. Some of the recipes that have been changed are "Melkkos", Asparagus dish, Grilled chicken kebabs, Pizza and Kabeljou.

In the recipes aimed at the **wheat-allergic** child's household, wheat was mostly replaced by potato flour, or a combination of potato and rye flour (Steinman, 2002) (filled potato, vegetable lasagne, baked brinjal and baked kabeljou), and a combination of rye and rice flour (rice and rye bread). The researcher did not experiment with other substitutes, because it is more convenient (McMahon & Cameron, 1998:19) and financially better for the caregiver to always use only one or two substitutes, than having to have a variety of flours in the house, which may become stale and obviously contribute to financial loss. Furthermore, the lunch of pizza on Day 5 replaced with stuffed slices of ham for both households with children allergic to wheat and cow's milk. Although pizza is a product that is seldom conventionally prepared at home, the recipes contains allergens and therefore the replacements were made. The couscous salad of Day 6 was also replaced by rice salad.

The recipes containing soy were limited for the household of the **soy-allergic** child. The researcher took care in selecting recipes that contain a variety of legumes and pulses, for example green bean, onion and bacon dish and warm spiced chickpea dish mostly due to the current food trend.

In the recipes for the household with the **cow's milk allergic** child, cow's milk was mainly replaced by soy milk e.g. "melkkos", filled potato, vegetable lasagne and baked brijal. This was done because it is convenient and cost effective to replace the cow's milk with just one substitute (McMahon & Cameron, 1998:19). Furthermore, most types of soy milk are enriched with Vitamin D and calcium - two nutrients that are usually deficient in the diet of milk-allergic children (Kruger, 2001:11). Goat's milk was not used because of the shared allergenicity between cow's milk and goat's milk (Steinman, 2002), although approxiamtely 40% of children allergic to cow's milk are also allergic to soy milk (Dr. H Steinam, Personal communication, 2002). The study does not focus on multiple allergies and therefore soy milk were used, but care must be taken when soy milk is given to cow's milk allergic children due to shared allergenicity. A similar situation is applicable between milk and beef. BSA is a protein found in beef and there is sometimes cross-reaction between cow's milk and BSA, therefore beef can be consumed by children allergic to cow's milk, but care must be taken.

Few of the recipes for the households of **egg-allergic** children had to be adapted, because they were selected to be free of egg allergens. In the case of bobotie egg as setting agent was replaced by smooth cottage cheese and white sauce, which was not an entirely satisfactory solution if the nature of this traditional dish is kept in mind. There were two menu items that have egg as the main protein source, namely the boiled egg for breakfast on Day 6 and omelette on Day 14 of lunch. These were replaced with whole-wheat bread and cheese.

The two-week menu cycles that were developed are examples of balanced eating plans. No constraints were placed on the type of meat offered or on ethnic or cultural setting, so the menu cycles compiled contain a mixture of recipes from many ethnic or cultural origins – typical of the South African cuisine. It was obvious that the food preference of a household would affect the cost, type of food eaten and time needed to prepare the meal (Quinn, Leung & Wanitprapha, 1995:3-4) and that these meal plans are merely guidelines or models from where to go further.

5.4 CONCLUSIONS AND RECOMMENDATIONS

From the example in Table 5.6 it was clear that respective menu items do not only belong to one Food Group. For this reason the measurement of nutritional adequacy, using the USDA Food Guide Pyramid as a quantitative measurement tool, is full of pitfalls and a more feasible tool has to be used, which will be reported in Chapter 6 for measuring nutritional adequacy. The USDA Food Guide Pyramid was developed for adults, therefore children will consume less than the recommended number of servings.

Hidden allergens appeared to be a problem when food is prepared and bought for the food allergic child. The example of butter and margarine in Table 5.3A shows that it is difficult to predict what will be found in food and care must be taken when food products are selected. It should also be taken into account that there may still be undeclared allergens in food.

The research on the recipes was limited to this developmental process and did not aim at evaluating the impact of the modifications on the sensory attributes or acceptability ratings of the product. This is a project on its own and further research to evaluate the eating quality of the recipes is recommended.

For the sake of the methodology in Chapter 6, as well as the fact that milk is the most common food allergy among children (Altman & Chiaramonte, 1996:1249) focus was placed on recipes for the milk-allergic child.

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CHAPTER 6: THE NUTRITIONAL ADEQUACY OF THE TWO-WEEK MENU CYCLE FOR CHILDREN ALLERGIC TO COW'S MILK.

6.1 INTRODUCTION

According to Taylor, Hefle and Muñoz-Furlong (1999:19) "the construction and implementation of safe and effective avoidance diets are often a challenge for individuals with food allergies". In a study done on "nutrition services for children with developmental and chronic illnesses in education programs" by Yadrick and Sneed (1994:1126) they recommended the analysis of menus for nutritional adequacy. Harvard Women's Health Watch (2000:1-2) reported that at the 2002 meeting of the annual American Academy of Allergy, Asthma and Immunology, researchers said that "children with food allergies are not consuming the recommended number of servings in The Food Guide Pyramid and emphasis needs to be given to finding dairy alternatives to make children with food allergies receive adequate intake of calcium and vitamin D for normal growth and development". Different nutritional emphasis is necessary with different food allergies.

Optimum nutrition is essential for children, because it helps them to be healthy (Kruger, 2001:11). According to Clarke, McQueen, Samild and Swain (1996:94), care should be taken during the management of food allergies to ensure that the patient's dietary intake is adequate to maintain normal growth and development in children and health in adults. In most cases this goal could be achieved with cautious dietary manipulation and the use of vitamin or mineral supplements when required. Roa (2002:S118) concluded after a study done on the nutrient intakes of pre-school and school children that the best approach to correct the deficiencies of nutrients is the food-based approach where nutrient-rich food supplements are formulated with nutrient-rich well-known foods, given to children at the household level.

Therefore, the research problem that formed the basis for this phase of the study was to evaluate the nutritionally adequacy of the developed two-week menu cycle for the children allergic to cow's milk.

The following terms are considered relevant to this chapter, namely (i) health, (ii) healthy, (iii) nutritional supplement and (iv) Recommended Dietary Allowance. **Health** it is state of optimal physical, mental and social well-being and not merely to be free of disease and infirmity (Dorland's Illustrated Medical Dictionary, 1994:736); **Healthy** is a state of complete physical, mental and social well-being and not merely to be free of disease (Kruger, 2001:11); pertaining to, characterised by, or promoting health (Dorland's Illustrated Medical Dictionary, 1994:736); **Nutritional supplement** means products containing any natural occurring molecules and molecules synthesised by chemical or biological means or botanical extracts, derivatives, concentrates, enzymes, coenzymes, co-factors, naturally occurring hormones and precursors, animal source substances or metabolites intended to be consumed for their nutritional value in the maintenance and improvement of human health and includes but is not limited to vitamins, minerals, co-factors, essential fatty acids, amino acids, enzymes, animal or botanical extracts and derivatives, probiotics and non-nutrient dietary phytoprotectants in a dosage form such as capsules, tablets, liquids or powders (Department of Health, 2002:12); **Recommended Dietary Allowances (RDAs)** (Table 2.6) are the amounts of nutrients needed to meet the requirements of nearly all (97% to 98%) of the healthy population (Thomas, 2000:333); are the levels of intake of essential nutrients considered, in the judgement of the Committee on Dietary Allowances

of the Food and Nutrition Board on the basis of available scientific knowledge, to be adequate to meet the known nutritional needs of practically all healthy persons (National Research Council, 1980:1).

The following operational definition for nutritional adequacy of the menu cycle was formulated: The developed two-week menu cycle for children allergic to cow's milk and their households was quantitatively evaluated with *FoodFinder™2* for nutritional adequacy for children between seven and ten years old according to the RDAs of the USA, for micro- and macronutrients. The results will be compared with the problematic nutrients identified in the National Food Consumption Survey in children aged 1-9 years: South Africa (Vitamin Information Centre, 2001) and WHO Dietary and Health Goals. The micronutrients identified by the National survey and reported in The Medical Update of the Vitamin Information Centre (2001:3) are calcium, iron, zinc, selenium, Vitamin A, D, E, C, B_6 , as well as riboflavin and niacin. Energy intake was also deficient. One of the pro-vitamin As, β-carotene, was also calculated. The WHO Dietary and Health Goals which focuses on fats, carbohydrates, proteins (cholesterol, sodium and dietary fibre were not part of the operational definition – though given by WHO) as well as the South African Prudent Dietary Guidelines were also used in the assessment which aided in understanding the contribution especially of the macronutrients to the energy-value of the diet. If a person consumes less than 67% of the RDA of a nutrient it is seen as inadequate (Vitamin Information Centre, 2001:4; Dr. P Wolmarans, Personal communication, 5 August 2002).

6.2 METHODOLOGY

In Chapter 5 the two-week menu cycles (See Tables 5.6 – 5.9) and the recipes (Addendum 10) pertaining to the menu cycles were developed. Therefore, to evaluate the nutritional adequacy of the two-week menu cycle the recipes in Addendum 10 were used as the point of departure.

6.2.1 Selection of a two-week menu cycle for evaluation

Only the developed two-week menu cycle for cow's milk-allergic children and their households were evaluated, based on the fact that the most common food allergy among children is for cow's milk (Altman & Chiaramonte, 1996:1249) and that 57% of the case study participants were children allergic to milk. Contributing to the decision was the Harvard Women's Health Watch (2000:1-2) that reported that at the 2002 meeting of the annual American Academy of Allergy, Asthma and Immunology, researchers emphasised the lack of sufficient calcium and Vitamin D consumption by milk-allergic children. Calcium and Vitamin D also seems to be a problem for South African children (Vitamin Information Centre, 2001:3). According to Kruger (2001:11) "groups of South African children studied tend to have lower calcium intakes than the recommended amounts". It is reasonable to expect that the biggest problem pertaining to nutrient-intake is calcium deficiency in the diets of the milk-allergic children, should the deficient intake of calcium of non-allergic children in general be borne in mind.

6.2.2 Serving portions

McKenzie, Dixon, Smiciklas-Wright, Mitchelle, Shannon and Tershakovec (1996:865,872) reported that very few studies have been done on the number of servings and serving sizes of foods within food groups consumed by children. Therefore, the serving sizes were an *ad hoc* decision for each recipe, given in Addendum 10, established by dividing the amount of servings per recipe into the total yield of the recipes.

McKenzie, *et al.* (1996:865,872) also stated that "for most food groups the recommended serving sizes may be larger than those typically consumed by young children, because many children achieved nutritional adequacy despite consuming fewer overall servings of foods from food groups." In their discussion they reported that various studies showed that variety among the six major food groups of the USDA Food Guide Pyramid, as well as the variety within the foods per group accounted for the variation in nutritional adequacy.

6.2.3 Measuring instrument and analysis of data

The South African legislation for labelling and marketing (Department of Health, 2002) used South African RDAs developed for people older than ten years of age as a guide. There also exists American (USA) RDAs for the following age groups of children, namely, 1-3, 4-6 and 7-10 without gender specification (Ganji, Betts & Whitehead, 1995:623), and 11-14 and 15-18 years of age with gender specification (Earl & Borra, 2002:334). Research with the aid of *Foodfinder^{TM}2* was conducted on the age group 7-10 years of age using the USA RDAs.

According to Earl and Borra (2000:332) the new Dietary Reference Intakes (DRI) are not yet finalised for all the nutrients nor were they taken up in the Department of Health's *Draft regulations governing the labelling and advertising of foodstuffs* (2002). Therefore, while this system of evaluating nutritional adequacy is not fully in use, the researcher relied on the Recommended Dietary Allowance (RDA) for guidance pertaining to nutritional adequacy.

FoodFinder^{TM}2 (Grant, Langenhoven, Stockton, Day & Bauermeister, 1991) was used to quantitatively evaluate the selected two-week menu cycle. *FoodFinder^{TM}2* computer software program was developed from the *MRC Food Composition Manual* (Langenhoven, Kruger, Gouws & Faber, 1991).

The two-week menu cycle for the cow's milk-allergic children and their households were evaluated per week and then for the whole two weeks. It seems to be unrealistic to aim to have a nutritional adequate food intake everyday or even every week. It is more feasible to aim at having balance over a certain period of time, e.g. in a two-week period, as this was in practice what really happens.

The individual recipes (Addendum 10) were added to the *FoodFinder^{TM}2* program, after an "individual" was created that was ten years old. The recipes were allocated to the specific day in the two-week menu cycle where it appeared on the daily meal plan. A *meal analysis* was done for each day. This entailed that the nutrients of all the recipes from one day of the two-week menu cycle were calculated. A meal analysis of all the recipes from days one to seven (see Table 6.1), days eight to fourteen (see Table 6.2) and all fourteen days (see Table 6.3) were then respectively calculated. These data were used as the results of this phase of the research.

Three common problems were encountered when using *FoodFinder^{TM}2*. *The values of some of the nutrients are not given.* The nutrients that have missing data on *FoodFinder^{TM}2* are marked in the results (see Addendum 13) with asterisks (*). For instance soy milk and goat's cheese contain no values for biotin. Sorghum porridge, e.g. *Maltabella,* contains no values for sodium, Vitamin A, B_6, D, E, folic acid, pantothenic acid and biotin. *Some ingredients are not listed in FoodFinder^{TM}2,* e.g. tapioca and couscous. These could lead to incomplete data and inaccurate calculations. Lasagne sheets were also not listed and macaroni had to be used during evaluation. *Spices and herbs are also not listed.* However, in this case, due to the negligible values (< 5% of recipes), the problem was less serious than in the other cases.

6.3 RESULTS AND DISCUSSIONS

The total nutrient analysis done by *FoodFinder*^{TM}*2* is included in Addendum 13. The contents of Addendum 13 represents the original printout from *FoodFinder*^{TM}*2* without any technical or other changes for methodological reasons. A summary of the nutrient analysis of week one (Days 1 - 7) is given in Table 6.1A. Only the nutrients that are relevant (see operational definition of nutritional adequacy in Section 6.1) have been included in Table 6.1A.

TABLE 6.1A: AVERAGE DAILY INTAKE OF ENERGY, MACRONUTRIENTS AND MICRONUTRIENTS OF MEAL PLANS FOR WEEK ONE AND CORRESPONDING CONTRIBUTIONS TO RDA

Description	Amount	RDA	RDA *
Energy (kJ)	6450	8368.0	77.1%
Macronutrients:			
Total protein (g)	58.8	28.0	210.2%
Plant protein (g)	23.2		
Animal protein (g)	35.3		
Fat	85.5		
Saturated FA (g)	11.6		
Mono-unsaturated FA (g)	20.4		
Polyunsaturated FA (g)	23.2		
Total trans FA (g)	0.2**		
Glycemic carbohydrate (g)	2623.6		
Minerals:			
Ca (mg)	236	800.0	29.5%
Fe (mg)	11.0	10.0	109.6%
Na (mg)	1499.0		
Zn (mg)	6.5	10.0	65.04%
Se (µg)	60.1	30.0	200.4%
Vitamins:			
Vitamin A (RE) (µg)	832.0	700.0	118.9%
β-carotene (µg)	3801.0		
Vitamin D (µg)	3.6	10.0	36.3%
Vitamin E (mg)	19.3	7.0	276.9%
Riboflavin (mg)	1.1	1.2	88.2%
Niacin (mg)	17.2	13.0	132.5%
Vitamin B_6 (mg)	1.62	1.4	115.7%
Vitamin C (mg)	279.0	45.0	619.7%

* These RDA values reflect minimum values due to missing data. **This amount reflects a minimum value due to missing data.

The discussion of Tables 6.1A, 6.1B, 6.2A and 6.2B is limited in this section. As explained, it is more feasible to look at the meal plans over two weeks (see Table 6.3A and 6.3B).

Table 6.1B summarises the analysis made for week one (see Addendum 13) according to the WHO Dietary and Health Goals, as overconsumption of these nutrients are associated with disease risk.

TABLE 6.1B: AVERAGE DAILY INTAKE OF MACRONUTRIENTS IN MEAL PLANS FOR WEEK ONE AND CORRESPONDING WHO DIETARY AND HEALTH GOALS

Fatty acids and cholesterol:	Values of week one	WHO Dietary Guidelines and Health Goals
Energy contributions by:		
Protein	15.5%	+/- 15%E
Fat	34.4%	< 30%E
Saturated	6.8%	< 10%E
Mono-unsaturated	11.7%	+ 10%E
Polyunsaturated	13.3%	10%E
Glycemic carbohydrate	50%	+/- 55%E
Cholesterol (mg)	249.0	
Total dietary fibre (g)	22.5	

A summary of the nutrient analysis of week two (Days 8 - 14) is shown in Table 6.2A. Nutrients that are relevant are listed in Table 6.2A (see next page).

Table 6.2B summarises the analysis made for week two (see Addendum 13) according to the WHO Dietary and Health Goals, as overconsumption of these nutrients are associated with disease risk.

TABLE 6.2B: AVERAGE DAILY INTAKE OF MACRONUTRIENTS IN MEAL PLANS FOR WEEK TWO AND CORRESPONDING WHO DIETARY AND HEALTH GOALS

Fatty acids and cholesterol:	Values of week two	WHO Dietary Guidelines and Health Goals
Energy contributions by:		
Protein	18.2	+/- 15%E
Fat	29.8%	< 30%E
Saturated	6.8%	< 10%E
Mono-unsaturated	9.1%	+ 10%E
Polyunsaturated	10.9%	10%E
Carbohydrate	51.9%	+/- 55%E
Cholesterol (mg)	244.0	
Total dietary fibre (g)	23.4	

TABLE 6.2A: AVERAGE DAILY INTAKE OF ENERGY, MACRONUTRIENTS AND MICRONUTRIENTS OF MEAL PLANS FOR WEEK TWO AND CORRESPONDING CONTRIBUTIONS TO RDA

Description	Amount	RDA	RDA *
Energy (kJ)	7073.0	8368.0	84.5%
Macronutrients:			
Total protein (g)	75.9	28.0	271.1%
Plant protein (g)	29.4		
Animal protein (g)	43.8		
Fat	56.0		
Saturated FA (g)	12.9		
Mono-unsaturated FA (g)	17.4		
Polyunsaturated FA (g)	20.8		
Total trans FA (g)	0.1**		
Glycemic carbohydrate (g)	137.9		
Minerals:			
Ca (mg)	366.0	800.0	45.7%
Fe (mg)	14.3	10.0	142.7%
Na (mg)	2078.0		
Cl (mg)	1300.0		
Zn (mg)	10.7	10.0	107.7%
Se (µg)	66.2	30.0	220.6%
Vitamins:			
Vitamin A (RE) (µg)	1170.0	700.0	167.2%
β-carotene (µg)	4024.0		
Vitamin D (µg)	3.3	10.0	33.1%
Vitamin E (mg)	17.5	7.0	250.4%
Riboflavin (mg)	1.4	1.2	119.6%
Niacin (mg)	22.7	13.0	174.6%
Vitamin B_6 (mg)	1.7	1.4	122.2%
Vitamin B_{12} (µg)	2.7	1.4	194.85%
Vitamin C (mg)	229.0	45.0	508.6%

* These RDA values reflect minimum values due to missing data **This amount reflects minimum values due to missing data

A summary of the nutrient analysis of the entire two weeks (Days 1 - 14) is given in Table 6.3A.

TABLE 6.3A: AVERAGE INTAKE OF ENERGY, MACRONUTRIENTS AND MICRONUTRIENTS OF MEAL PLANS FOR ENTIRE TWO WEEKS

Description	Amount	RDA	RDA *
Energy (kJ)	6761.0	8368.0	80.8%
Macronutrients:			
Total protein (g)	67.4	28.0	240.6%
Plant protein (g)	26.3		
Animal protein (g)	39.6		
Fat	70.8		
Saturated FA (g)	12.3		
Mono-unsaturated FA (g)	18.9		
Polyunsaturated FA (g)	22.0		
Total trans FA (g)	0.2*		
Glycemic carbohydrate	1380.8		
Minerals:			
Ca (mg)	301	800.0	37.6%
Fe (mg)	12.6	10.0	126.2%
Na (mg)	1788.0		
Cl (mg)	964.0		
Zn (mg)	8.6	10.0	86.4%
Se (µg)	63.1	30.0	210.5%
Vitamins:			
Vitamin A (RE) (µg)	1001.0	700.0	143.1%
β-carotene (µg)	3913.0		
Vitamin D (µg)	3.5	10.0	34.7%
Vitamin E (mg)	18.45	7.0	263.6%
Riboflavin (mg)	1.3	1.2	104.4%
Niacin (mg)	20.0	13.0	153.6%
Vitamin B_6 (mg)	1.6	1.4	116.6%
Vitamin C (mg)	254.0	45.0	564.2%

* These RDA values reflect minimum values due to missing data **This amount reflects minimum values due to missing data

Table 6.3B summarises the analysis made of the entire two weeks (see Addendum 13) according to the WHO Dietary and Health Goals and SA Prudent Dietary Goals. Both Tables 6.3A and 6.3B will be discussed in Section 6.3.1 in terms of the contribution of the two-week menu cycle to the average daily intake of macronutrients (which in turn determine the energy value of the diet). In Section 6.3.2 the micronutrients will be discussed.

TABLE 6.3B: AVERAGE DAILY INTAKE OF MACRONUTRIENTS IN MEAL PLANS FOR ENTIRE TWO WEEKS

Aspects	Average values of days 1-14	WHO Dietary Guidelines and Health Goals	South African Prudent Dietary Goals
Energy	80.8%	-	To achieve and maintain normal health
Contributions by:			
Protein	16.9%	+/- 15%E	12 – 15%
Fat	32.0%	< 30%E	25 – 30%
Saturated	6.7%	< 10%E	8%
Mono-unsaturated	10.4%	+ 10%E	12%
Polyunsaturated	12.1%	10%E	10%
Glycemic carbohydrate	50.0%	+/- 55%E	50 – 60%

6.3.1 Macronutrients

The total **energy** intake over the two weeks was 80.8%, which is considered adequate (kJ >67% of the requirement of 7-10 year olds). Children require energy for growth (Kruger, 2001:11) body homeostasis, thermoregulation and activity (if mobile). As children mature growth and metabolic rate slows, the total need for energy and protein increases because body size increases (Smolin & Grosvenor, 2000:475). No additional snacking, cookies, pudding or sweets were incorporated into the two-week menu cycle, therefore under 'normal' circumstances the total amount of energy would probably have been higher.

The **proteins** contributed 16.9% of the energy value, slightly higher than the recommendations of the WHO Dietary and Health Goals and the South African Prudent Dietary Goals. Protein is necessary to sustain normal growth in children (Kruger, 2001:11) and maintenance of all the tissue (Smolin & Grosvenor, 2000:475).

The two-week menu cycle was evaluated against the WHO Dietary and Health Goals and the South Afriacn Prudent Dietary Goals and the results are the following: The **total fat** over the two-week period is 32.0%, slightly higher than the recommendations. "Fats are concentrated sources of energy and help to absorb fat-soluble vitamins" (Kruger, 2001:11). According to Mckenzie *et al.* (1996:871) the main food groups that contribute to the total fat intake includes the meats, dairy products, fats/oils and desserts. The developed two-week menu cycle for the cow's milk-allergic child included no desserts and a limited amount of dairy

products which obviously had to be ommited, due to the allergy. The fats/oils were used selectively and lean meat was chosen as far as possible.

The *saturated fatty acids* are 6.7% and close to the recommendations by the WHO Dietary and Health Goals and the range set by the South African Prudent Dietary Goals, which is extremely good, due to the known negative effects saturated fats have. The reason for the low percentage of saturated fats was mostly due to the total avoidance of butter and margarine, as a result of the possible hidden allergens in their composition for the child allergic to cow's milk. ß-carotene oil can also be used to replace the butter/margarine. It is high in ß-carotene, which boosts the immune system and could be used in menu plans low in Vitamin A. However, it is exspensive. The *polyunsaturated fatty acids (PUFA)* are 12.1% of the energy - slightly higher than the recommendation by WHO and the limit set by the South African Prudent Dietary Goals due to its known adverse effects. The trans fatty acids are 0.6% of the energy and it is recommended to be less than 1% of the energy. The reason for this value is the omission of butter and margarine in the diet. The *mono-unsaturated fatty acids (MUFAs)* are 10.4% of the energy – very close to the WHO recommendation and that of SAPDG of 12 %. Most of the fat categories are higher than the recommendations of WHO, with the exception of the saturated fatty acids which are lower.

The **total carbohydrates** contributed 51.0% of the energy - less than the recommended 55 to 75% according to WHO abd the 50-60% of the the South African Prudent Dietary Goals. Carbohydrates should be the main source of energy in individuals (Kruger, 2001:11). Sweets and sweetened beverages are sources of quick energy but must be consumed in limited amounts. However, very little refined sugars and snacks and no sweets were included.

6.3.2 Micronutrients

The macronutrients will be discussed in two sections, namely minerals and vitamins.

6.3.2.1 Minerals

The daily **calcium** content of the two-week menu cycle was average 37.4% of the RDA. The calcium intake was clearly inadequate (<67%). Most soy milk on the market (an observation made from informal product scouting) are enriched with calcium, therefore the percentage of the RDA would probably be higher than estimated here. However, one of the main problems encountered with cow's milk allergic children is the insufficient intake of calcium as reported at the Harvard Women's Health Watch (2000:1-2) 2002 meeting of the annual American Academy of Allergy, Asthma and Immunology. Calcium needs, relative to body size, are the greatest during the first year of life, when skeletal mass doubles. During the pre-school and early school years children still need 2-4 times more calcium per kilogram body weight than adults. An optimal calcium intake is related to a decrease in the risk of developing osteoporosis later in life. Groups of South African children studied tend to have lower calcium intakes than the recommended amount (Kruger, 2001:11).

According to Baker and David (1997:48) there is no data on how calcium absorption is affected by the type of milk formula used, or the effect of excluding other food groups from the diet and the allowance for catch up growth in a poorly nourished child. Calcium-containing non-dairy foods are less well absorbed and there may be deficiency in available calcium despite a reasonable overall intake (Baker & David, 1997:49). Some

form of nutritional supplement high in calcium needs to be used additionally to the diet. Care must be taken that the type of calcium used in the supplement is absorbed.

The average daily **iron** content of the developed two-week menu cycle was 126.2% of the RDA. "Iron is essential for cell differentiation, immune function, oxygen transport, myelination of nerve cells and is an enzyme cofactor" (Kruger, 2001:11). Iron is important to the food-allergic child because insufficient iron can lower the child's resistance to illness and prolong recovery time (Smolin & Grosvenor, 2000:477). Furthermore, weight loss can be due to iron deficiency (Kruger, 2001:11-12). The world's most common nutritional deficiency disease is iron deficiency anaemia (Anderson, 2000:125). Iron absorption is influenced by a variety of factors and this may be one of the reasons why iron deficiency anaemia is a common problem (Kasdan, 1996:717).

The best source of iron is liver. Other good sources are oysters, seafood, kidney, heart, lean meat, poultry and fish. The best plant sources are dried beans and vegetables. Milk and milk products are practically devoid of iron (Anderson, 2000:125). Hence, a dairy-free diet will not affect iron intake.

The average daily **zinc** content of the two-week menu cycle was 86.4% of the RDA. Zinc is necessary for a large range of metabolic processes (Kruger, 2001:11). Firstly, for growth and secondly, mild zinc deficiency is probably associated with reduced resistance, leading to infection in children. In severe zinc deficiency an increased risk of diarrhoea and respiratory diseases is common (Anderson, 2000:132). High concentrations of zinc are found in red meat and poultry.

The average daily **selenium** content of the meal plan over the two weeks was 210.5% of the RDA. The selenium concentrations in foods depend on the selenium content of the soil and water where the food was grown. Some of the main food sources of selenium are brazil nuts, seafood, kidney, liver, meat and poultry. Fruit and vegetables have a low selenium content (Anderson, 2000:141).

6.3.2.2 Vitamins

The average daily intake of **Vitamin A** was high, being 143.1% of the RDA over the two weeks. "Vitamin A is essential for normal growth, eyesight, bone development, iron mobilisation from bone stores, immunity, as well as the maintenance of epithelial tissue. The association between vitamin A status and growth may be explained by the role of vitamin A in reducing infection, allowing optimal growth. Vitamin A deficiency has been shown to increase host susceptibility to infections and diarrhoea through its role in maintaining the mucous membranes" (Kruger, 2001:12). Vitamin A is thus important to the food-allergic child to reduce infections and increase immunity. Persistent large doses of Vitamin A, over 1000 times the required amount, can become toxic (Combs, 2000:74). The menu cycle developed has high amounts of Vitamin A but still not nearly high enough to produce intoxication. The B-carotene amount divided by six gives the amount of Vitamin A in the menu cycles, and this also adds to the vitamin A content.

The average daily **Vitamin D** content of the two-week menu cycle was inadequate (34,7% of the RDA). Exposure to sunlight was not taken into account. In a study done by McKenzie *et al.* (1996:869) Vitamin D was the only nutrient below 67% of the RDA after intervention. Vitamin D_3 occurs naturally in animal products, the richest source being fish liver oils. It is also found in very small amounts in butter, cream, egg yolk and liver. However, a large amount of products are fortified and enriched with Vitamin D. Vitamin D is very stable and does not decline when foods are heated or stored for lengthy periods (Combs, 2000:77).

McKenzie *et al.* (1996:869) suspects the reason for the low Vitamin D intake is due to children's low intake of fluid milk, an essential dietary source of Vitamin D. The cow's milk allergic child's diet is totally depleted of fluid milk, although most soy milk is enriched with calcium and Vitamin D, not taken into account in *FoodFinder*^{TM}*2*. There is a close relationship between calcium and Vitamin D. McKenzie *et al.* (1996:869) also stated that Vitamin D values for many foods are missing from nutrient programs and gives credence to this reasoning. A Vitamin D supplement is recommended.

The average daily **Vitamin C** content of two-week menu cycle is 564.2% of the RDA. Vitamin C is an anti-oxidant and is found in both animal and plant tissues as dehydroascorbic acid and ascorbic acid (Anderson, 2000:100). The best sources are fruits, vegetables and organ meat, "but the actual ascorbic acid contents of foods can vary with the conditions of growth and the degree of ripeness when harvested" (Anderson, 2000:102). A deficiency in Vitamin C can be seen in lesions occurring with wound healing, oedema, haemorrhages, weakness of bone, cartilage, teeth and connective tissue (Anderson, 2000:103). Large amounts of fruits are included in the meal plan and are partially responsible for the high Vitamin C content.

The average daily **Vitamin E** content of the two-week menu cycle is 263.6% of the RDA. Common food sources high in Vitamin E tend to be high in fat (McKenzie *et al.,* 1996:872). Only plants synthesise Vitamin E, the richest source being oils (Combs; 2000:81). Although, the total fat content for the developed two-week menu cycle is below the recommended value, the Vitamin A percentage is far above the recommended value, this being ascribed to the fact that all butter was replaced by vegetable oils.

The average daily content of **riboflavin** was 103.9% of the RDA for the two-week menu cycle, and most satisfactory. Riboflavin is essential for the metabolism of carbohydrates, amino acids, lipids, and supports antioxidant protection. Deficiencies are first seen in tissues with rapid cellular turnover, such as the skin and epithelia (Anderson, 2000:86). Leafy green vegetables, meats and dairy products are the main sources of riboflavin (Anderson, 2000:89).

The **niacin** content was more than adequate. The average was 153.6% of the RDA over the two weeks. Deficiencies in niacin are manifested as muscular weakness, anorexia, indigestion and skin eruptions. In severe cases it can lead to pellagra that is characterised by dermatitis, dementia and diarrhoea, tremors and sore tongue (Combs, 2000:90).

The **Vitamin B_6** content was also more than adequate. The Vitamin B_6 average daily content of the two-week menu cycle was 116.6% of the RDA. Vitamin B_6 influences behavioural and cognitive outcomes, it is important for learning and memory (Kruger, 2001:12; Crombs, 2000:92-92).

6.4 CONCLUSIONS AND RECOMMENDATIONS

A relatively balanced two-week menu cycle was developed with only sources of calcium and Vitamin D being insufficient and zinc requiring some attention. Therefore food supplements, with a high calcium and vitamin D absorption rate is recommended for these children and attention should be paid to sources that will supplement the zinc content of the diet.

Comparison of the selected vitamins and minerals in terms of their RDA is shown in Table 6.4. Only calcium and Vitamin D content of the menu cycle was deficient. The zinc content was sufficient, despite it being less

than 100%. All the other vitamins were more than 100% of the RDA. None of the vitamins or minerals were in excessive amounts that toxcitity should be an issue.

TABLE 6.4: ADEQUACY OF VITAMINS AND MINERALS IN TERMS OF THEIR RDA

<67%	>67 <100%	>100%
Calcium	Zinc	Iron
Vitamin D		Selenium
		Vitamin A
		Vitamin C
		Vitamin E
		Riboflavin
		Niacin
		Vitamin B_6

In a study done by Kim and Keen (2002:433) they concluded, "thirty two percent of their participants – mothers - provided their school children with vitamin/mineral supplements. Use of supplements was higher in school children in lower grades and in higher socio-economic groups. Multivitamin-mineral supplements were provided most frequently. Dietary habits were poorer in school children who did use supplements than in those who did not". If this two-week menu cycle is followed no supplementation, except for calcium and Vitamin D are necessary.

Relatively low amounts of glycemic carbohydrates were included. Bread which appears on the bases of the USDA Food Guide Pyramid will raise the carbohydrate percentage, and lower protein contribution of energy.

This two week menu cycle provided a variety of foods. In reality many households are unlikely to provide this variety (Vitamin Information Center, 2001:8). Reasons for this possibly included financial constraints and a lack of nutritional education. According to Smolin and Grosvenor (2000:478-479) and McKenzie *et al.* (1996:871) it is necessary for children to consume a variety of foods. If that is the case the chances are much better that the child will adhere to the diet (because diet can be varied and the more and be more interesting) at the same time consuming a healthy, balanced diet.

This study found that the meal plans (two-week menu cycle) for children allergic to cow's milk in the age group seven to ten years, was nutritionally adequate in most respects, except calcium and vitamin D content – it was deficient in these micronutrients. Thus, calcium and Vitamin D supplementation is essential when omitting cow's milk from the diet.

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CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 OVERVIEW OF THE THESIS

In **Chapter 1** the rationale for the study was explained as that food allergies are a growing problem and have considerable economic consequences. Yet little literature is available on the impact on households and the needs of the persons involved. Currently, there is no medication to cure food allergies and strict avoidance diets have to be followed to prevent the reactions to the allergens. The objectives and the limitations of the study were given. A chapter outline was provided for the rest of the study.

Chapter 2 gave a review of all the relevant literature pertaining to the study. This included the literature on food allergies, the adverse food reactions, symptoms and hidden allergens. The potential effect of breast-feeding was also discussed. The selected allergies discussed for the purpose of this study, namely wheat, soy, cow's milk and egg were explored, followed by the properties these ingredients have in cooking and the effect on the menu items should they be omitted in the cooking process. Suitable replacements for these allergens were listed whereafter the discussion shifted to menu planning, different aspects of meal plans and different factors that influence food choice and recipe development. The role of the "caregiver" was explained and the different research methodologies of the study, namely qualitative research - focus group technique and case studies - and quantitative research, using the software program *FoodFinder*^{TM}*2,* were discussed.

Chapter 3 covered the focus group meetings done with caregivers of children allergic to wheat, soy, cow's milk and egg. Two preliminary focus group meetings were held at The Red Cross Children's Hospital, and for the main study a further three meetings were held. A schedule was developed to allow the discussions to flow and an experienced moderator conducted the meetings. Valuable information on the perspectives of the caregivers of the food-allergic children was gathered. It appeared that more in-depth information was needed, and therefore case studies were conducted.

Chapter 4 describes the case studies. Seven participants from the focus group meetings were selected by specific criteria and five units of investigation within each case were investigated. The units were: the (i) caregiver, (ii) allergic child, (iii) "non-caregiver" parent, (iv) other children and (v) household. The results from the case studies confirmed the findings of the focus groups. It became clear that there was a greater need for healthy meal plans for balanced daily intake, than for recipes (although obviously meal plans will determine the particular recipes selected). There was a general lack of nutrition knowledge among the caregivers.

Chapter 5 reported developmental research. Four two-week menu cycles were developed for the households with children allergic to wheat, soy, cow's milk and egg respectively. The menu cycles appeared to be the same, but different substitutes were used for the different allergens in the adapted recipes and a few menu item options had to be considered, for example omelette could not be used in the case of the children allergic to egg. Product scouting was done on commercial products to identify allergen-free convenience products. The identification of unsuitable products will contribute to the alleviation of the problems of these households (see Section 7.3).

The quantitative evaluation of a two-week menu cycle for nutritional adequacy was described in **Chapter 6.** The two-week menu cycle for households with children allergic to cow's milk was evaluated with

FoodFinder™ 2. The results were discussed according to the WHO Health and Dietary Goals. The adequacy of nutrients that were identified to be deficient in South African children during a national survey in 1999 was also assessed in this phase of the study.

7.2 ISSUES THAT SURFACED

At the onset of the research quantitative research was planned applying the survey procedure. Despite the fact that the questionnaire was developed and that a pilot study was conducted, it became clear that the survey procedure using a questionnaire which was to be completed by the caregivers of children allergic to wheat, soy, cow's milk and egg was inappropriate. More descriptive data were required for this study, and it was decided to implement a qualitative approach, combined with qualitative research techniques. This qualitative research technique better answered the research question. The recipes were adapted and developed to be tested for both nutritional adequacy and taste. After discussions with experts it appeared as if testing sensory acceptability of meals with children, with a special need, would be a study on its own.

Many of the caregivers stated that a doctor diagnosed their children to be food-allergic, so the researcher assumed that it was done according to an approved confirmatory test. It appears as if there is sometimes a degree of guessing involved when food allergies are diagnosed due to the enormous uncertainty among caregivers about what food to avoid. The possibility of misdiagnosis of food allergies on the part of the physicians (see Section 3.2.1.2) is a serious problem and needs to be addressed. The involvement of medical practitioners with the well being of food-allergic children is debatable (see Section 3.2.2.1. and Addendum 6).

There is confusion amongst consumers regarding the terminology 'wheat, corn and maize'. The American and European terms differ for these products: corn is the American English word for maize, while for the South African and European consumer it implies wheat. There was uncertainty amongst the participants whether their children were allergic to wheat, maize or both.

At the onset of the study the researcher aimed to incorporate functional foods. Due to the fact that they are not always quantifiable, little focus was given to these ingredients apart from the fact that herbs and spices representing some functional components were deliberately incorporated and large amounts of fruit and vegetables were used in the meal plans.

Commercial products form a large percentage of consumers' daily food. Problems encountered with food labels make it firstly difficult to avoid allergens and secondly wastes time for the consumer who has to obtain the information. Main and hidden allergens posed a big problem for the participants. They had difficulty identifying what food additives are permitted in the diets of the respective allergic children. It was disturbing to note that some commodities used daily by participants, for example specific margarine brands, contained all four types of allergens and in some cases the hidden allergens were not declared. Inadequate labelling and sophisticated terminology complicate the identification of hidden allergens for the lay consumer.

Organisation and decision-making skills regarding food preparation differed remarkably among the consumers in this study, although it did appear as though all the participants were able to adapt their method or schedule at short notice. Some participants however, had no procedure for the planning and organising of food preparation.

The use of recipes and recipe books was limited. Participants felt that recipes were too complicated, contained too many ingredients, the ingredients were not always available in their homes and it took too much time and effort to prepare food from recipes. Furthermore, their families preferred "everyday" food - not the "fancy" food in recipe books.

Negative emotions were encountered in some cases, where the children were teased. They felt ashamed of their appearance or they felt different from the other children. They were not allowed to eat everything that their peers do, and this added to their sense of isolation. Therefore, the researcher developed four menu cycles (for the four different allergies) that appeared almost identical. This made it possible that everybody in the household could eat the same, so that the allergic child could feel included in the family.

A major issue that emerged, and was not part of this qualitative and quantitative investigation, but which should be noted here, is the evolving nature of this study field. It requires a particular attitude towards the understanding of the problems of the allergic child.

7.3 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations will be discussed under the following headings: (i) for the research methods used and further research recommended (ii) conclusions and recommendations for the households (iii) conclusions and recommendations for the food industry and (iv) conclusions and recommendations for education.

7.3.1 Conclusions and recommendations regarding the research methods used

Two major data collection techniques were used in the study, namely qualitative research where the focus group technique and case studies were used and the quantitative research technique for the evaluation of the nutritional adequacy of the menu cycles. Where the qualitative technique is concerned there is a poor perception of its standing with researchers generally, due to a positivist approach. However, the researcher concluded that for the information required in this study, the qualitative approach was appropriate.

7.3.1.1 Focus group technique

The aspects that were most prominent during all three focus group meetings were the helplessness the households with food-allergic children felt shortly after diagnosis. They all had a problem with eating out at restaurants or at friends' houses. Meal planning and preparation of meals were, in most households, spontaneously done with little structure or planning. All of them also complained about the cost of allergen-free products and the difficulty they sometimes had in obtaining them (see Section 7.3).

Many of the participants hoped to be helped or educated through the study, but that was not the aim of the study, although a food allergy information session was held. The researcher recommends that educational programs for caregivers and the allergic child must be developed on the issues identified (see Section 7.5).

It is important to organise transport for some of the participants. Also, bad weather or a lack of transport will interfere with participation. An experienced moderator, familiar with the topic, is essential to gain all the available data. The moderator should also be rather strict, so that the participants stick to the planned structure and attention remains focused.

7.3.1.2 Case study technique

The case studies were interesting in that the researcher entered the participant's daily environment. No significant or unexpected data were gathered, but insight and compassion for their daily problems and needs were developed.

The case studies took time and sacrifices had to be made by the participants. Therefore it is important to choose enthusiastic participants. Their privacy was invaded on more than one occasion, e.g. during the inspection of their food cupboards and the unannounced visit for supper. This required sensitivity.

It is important that the fieldworker entering the participants' homes, should be easy to talk to and comfortable with the situation. If not, the situation will become uncomfortable and stressed. The characteristics of a suitable fieldworker/observer would be someone who is caring and compassionate.

It became apparent that hidden allergens on food labels posed a problem, and that planning and organising meals were troublesome. Furthermore, the children had suffered psychological damage due to the food allergy.

7.3.1.3 Development of two-week menu cycles

Products commonly found in households were investigated for main and hidden allergens - from the lowest level of the USDA Food Guide Pyramid to the foods in the upper level. This product scouting stressed the common problem of identification of main and hidden allergens on food labels. The informal product scouting on margarines also identified the problem of unspecified allergens, for example emulsifiers are mentioned on the label, but not the source (egg or soy) of the emulsifiers.

The four two-week menu cycles were developed according to procedure developed. The recipes selected for the two-week menu cycles had to be free from allergens, but still have the same structural properties than the original recipes and an acceptable taste. It appears as if in many cases one of these two properties were compromised or another recipe had to be selected.

7.3.1.4 FoodFinder ™ 2

FoodFinder ™ 2 is a user friendly software program, but has some problems. The major problem was that the program is not complete. This in turn led to three common problems. The values of some of the nutrients are not given. Some ingredients are not listed in *FoodFinder™ 2*, e.g. tapioca and couscous. These could lead to incomplete data and inaccurate calculations. Spices and herbs are also not listed. Thus, it is difficult to determine accurately the nutritional adequacy since the program is incomplete and some of the food is enriched with vitamins and minerals. Therefore, despite using *FoodFinder ™ 2* it is a slight under-estimated calculation - apart from the fact that obviously the nutrients given for the particular food ingredients are not necessarily the nutrients they in fact contain. Alternatives for ingredients that are not listed on *FoodFinder ™ 2* program had to replace the missing ingredients. The software program can analyse the ingredients as such, or as recipes or as part of a meal plan. Familiarity with the program is important, to simplify procedure.

The two-week menu cycle for the child allergic to cow's milk was nutritionally adequate for most of the nutrients except, calcium and Vitamin D. Supplementation is recommended for these nutrients. No

additional snacks or sweets were included in the menu cycle which might have had an effect on the energy value of the menu plans, which was also slightly low.

7.3.1.5 Further research recommended

Authentic portion sizes and RDAs for children need to be established, so that better nutritional provision can be made for children in South Africa. Furthermore, the missing values in food composition tables need to be obtained, so that accurate nutritional calculations can be made. The nutrients of the menu cycles that were developed are likely to have underestimated values (see Section 6.2.3).

The research and development of adult educational programs are necessary. In these programs the researcher would like to include "herb garden planting and maintenance" (see Section 7.3.4.1). This would also adress the problem of the blandness of allergen-free recipes as it appears to be a common.

For further studies in this field it is recommended to have back-up from medical doctors and dietitions. A methodological procedures should be developed to incorporate these experts, in further research programs.

The dishes prepared from the recipes of the developed two-week menu cycles need to be evaluated from a sensory point of view to meet these requirements. Only a limited number of these recipes were tested informally for sensory qualities.

7.3.2 Conclusions and recommendations for households

A need was identified for literature on the social, physical and emotional needs of food-allergic children and members of the households. Social studies on these children's needs, and the problems they, as well as their families, encountered regularly were lacking. Such literature will contribute to a better understanding of their needs and make provision for them in society. In this respect this research has made a contribution.

If the caregivers or medical doctors suspects a child to suffer from a food-allergic condition, it is important to test the child according to an approved confirmatory test. This will ensure an accurate diagnosis and only foods containing allergens need to be omitted from their diets.

In the case studies where the food-allergic condition was accepted as a tolerable condition in the household and no issue was made of the condition, the children were more relaxed and well adjusted to the situation. They try to accommodate the allergic child's eating requirements as far as possible and adapt recipes and food preparation methods to avoid the presence of the particular allergens. Caregivers should accept the situation and the child should be handled as any other normal child. Also, the situation should be explained to the other children, so that they will understand and not put pressure on family cohesion by demanding food one child is not allowed to eat.

Eating out at restaurants or at the homes of friends was identified as a problem by most of the participants. At restaurants special care must be taken beforehand to ensure allergen-free food. The children immediately feel different in these situations.

Self-discipline is a necessity in food-allergic children, because they are sometimes in situations where they themselves have to choose what food they may have. They also get into situations where they should choose to tell hostesses of their condition – sometimes under awkward circumstances. Some children use

this time away from their parents to eat wrong foods just to escape the strict discipline of their homes. It appears as if the food-allergic child is forced at young age to become independent.

Talking to consumers with similar problems encountered with an allergic child in the household can help in supplying practical tips on food preparation, label reading and other needs. They can also support the caregiver, and simplify and shorten the "trial-and-error" time.

The researcher concluded that the households with the food-allergic children are in great need for support, especially just after the diagnosis of the allergy. Support is needed with food preparation adjustments, allergen identification, symptom management, socio-emotional issues of the child and family cohesion. It became clear that the female figures in the households are primarily responsible for the handling and management of the allergic situation.

Only a few of the participants in the focus groups, or in the households that took part in the case studies, really had any idea of what is implied by health consciousness. Furthermore, there is no clear definition of the term health consciousness – though literature abounds. There is an overall lack in nutrition knowledge, a fact handicapping the improvement of the physical well being of their children. It appears as if nutritional supplementation of the diets of the allergic children are essential, especially calcium and Vitamin D. Some forms of calcium however, are difficult to absorb in the body for example calcium carbonate has a very low absorption. Calcium lactinate and calcium citrate have better absorption in the body and therefore care must be taken when selecting a suitable supplement.

7.3.3 Recommendations and conclusions for the food industry

The identification of hidden allergens is a problem for the consumer. They do not know nor understand the terminology, they waste time by reading food labels and not all food labels declare the necessary information. If the food-allergic consumers are in doubt about a product they should rather avoid it. Therefore the food manufactoring companies should make label reading "easy" by using common, understandable names for allergens and have all the pertinent information declared. If it is possible that food could be contaminated with an allergen – the label should state the possibility. If a secondary ingredient of a compound product contains allergens, it should also be declared after the ingredient in brackets. Suppliers should carefully plan their labelling to accommodate these consumers.

Special convenience foods can be developed for the allergic child, that are both nutritionally adequate and have an acceptable taste. Caregivers that have little time to prepare meals and that are health conscious would make use of these products. However, the cost of these products must not be unrealistically high.

If restaurants can cater additionally for the allergic consumer they will attract customers they otherwise might not have had. If restaurants start showing a sensitivity for the allergic patron by professional waitressing and appropriate training of chefs in order to provide allergen-free dishes on their menu, socialising for the households affected by food-allergies would be much easier.

7.3.4 Conclusions and recommendations for education

The education of consumers on food-allergies are important. If consumers are educated on food-allergies the condition and the children affected could be handled better.

7.3.4.1 Education at home by caregivers

Caregivers should educate their food-allergic children to have self-dissipline by avoiding food they are not allowed to eat, and to read food labels for main and hidden allergens.

Children should be educated from an early age how to handle situations when away from home, for example when visiting friends or eating at a restaurant. They need to socialise normally and by avoiding situations outside the house would only complicate matters.

7.3.4.2 Adult and secondary educational programs

When educational programs are developed, focus should primarily be given to women. They mostly make the decisions regarding meal planning, food preparation and shopping. They are primarily the caregivers and therefore usually spend more time with the food-allergic child.

The need exists to educate these women in the purchasing of food and organising and planning of meals so that a cost and time effective approach can be followed. Education on balanced meals and efficient nutrition are also important. The further need is to develop educational programs to explain food allergies, hidden allergens, label reading and educate people so that they will manage their allergies better. Caregivers also need support and counselling, after the diagnosis of their children. Additionally, supportive information with tips and telephone numbers to assist these people will help them adapt to their new life style and will minimise the "trial-and-error" phase.

Once such programs are available, the doctors who diagnose the children can distribute the information and promote the program. Educators specifically equipped for such a need is the consumer scientist (foods) in close collaboration with a dietitian and allergist.

7.3.4.3 Education of the community

There is a need to educate all consumers on food allergies, especially those who work with children. Organisations or educational settings should educate their employees to be informed on food-allergies, so that they can help and support children affected, know what is expected of them and how to manage the situation when they encounter it. Other children should learn about food-allergies, so that they know what is "wrong" with their friends and this will empower them to handle the situation better, to prevent unnecessary teasing and hardship.

7.4 CLOSING REMARKS

Food allergy is a very dynamic field, constantly evolving with new scientific evidence. Different allergens, new cross-reactions and multiple allergies surface daily when the scholar is kept up to date with subject-related literature. Food allergy is a growing concern as more children are daily diagnosed with food allergies. The financial and social implications of this condition is unique and attention has to be given to this problem.

Working with food-allergic households made it clear that these consumers are in need of help on various matters. They have to adapt their life style and way of thinking, mostly without any help or support. The

food industry and educational environment make little provision for their specific needs. Social circles and the cohesion within the family put a lot of pressure on these consumers.

Sensitivity towards these consumers led to an increased empathy with these consumers affected by food allergies. They have to adapt their whole life style without any warning or support. To effectively manage a food allergy is hard work, sometimes without support of family or friends. The researcher concluded that care must be taken to try and accommodate these people more actively by appropriate educational programs.

ADDENDUM 1

UNIVERSITEIT VAN STELLENBOSCH
UNIVERSITY OF STELLENBOSCH

8 Oktober 2001

Me S Matthee
Departement Verbruikerswetenskap
Stellenboschkampus

Geagte me Matthee

NAVORSINGSPROJEK : "RECIPE DEVELOPMENT FOR THE ALLERGIC CONSUMER - A THEORETICAL APPROACH"
PROJEKNOMMER : 2001/C091

Met verwysing na u aansoek om algemene registrasie van bogenoemde navorsingsprojek, deel ek u graag mee dat **voorlopige goedkeuring** verleen is dat u met die werk kan voortgaan. U aansoek sal egter op sy eersvolgende vergadering vir bekragtiging aan die Subkomitee C van die Navorsingskomitee voorgelê word, waarna ons weer met u in verbinding sal tree. **Die vraeboog wat gebruik sal word moet ook voorgelê word.**

Nieteenstaande hierdie voorlopige goedkeuring kan die Komitee te eniger tyd versoek dat werk aan die projek tydelik gestaak word in afwagting op verdere inligting wat hy nodig mag ag om 'n finale besluit oor u aansoek te kan neem.

U moet asseblief in verdere korrespondensie na bogenoemde projeknommer verwys.

Ek vestig graag u aandag daarop dat pasiënte wat deelneem aan 'n navorsingsprojek in Tygerberg-hospitaal nie gratis behandeling sal ontvang nie aangesien die PAWK nie navorsing finansieel ondersteun nie.

Die verpleegkorps van die Tygerberg-hospitaal kan ook nie omvattende verpleeghulp met navorsingsprojekte lewer nie weens die swaar werkslading waaronder hulle reeds gebuk gaan. Dit kan dus van 'n navorser verwag word om in sulke gevalle privaat verpleegkundiges te verkry.

Met vriendelike groete

CJ VAN TONDER
NAVORSINGSONTWIKKELING EN -STEUN (TYGERBERG)

CJVT/ev

aa Dr MC Vosloo

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6 November 2001

Me S Matthee
Departement Verbruikerswetenskap
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Geagte me Matthee

NAVORSINGSPROJEK : "RECIPE DEVELOPMENT FOR THE ALLERGIC CONSUMER - A THEORETICAL APPROACH"
PROJEKNOMMER : 2001/C091

My brief van 8 Oktober 2001 verwys.

Baie dankie vir die vraelys wat by u brief van 17 Oktober 2001 aangeheg was.

Ek bevestig graag hiermee dat Subkomitee C van die Navorsingskomitee die goedkeuring van bogenoemde projek op sy vergadering van 29 Oktober 2001 bekragtig het.

Met vriendelike groete

CJ VAN TONDER
NAVORSINGSONTWIKKELING EN -STEUN (TYGERBERG)

CJVT/ev

aa Dr MC Vosloo

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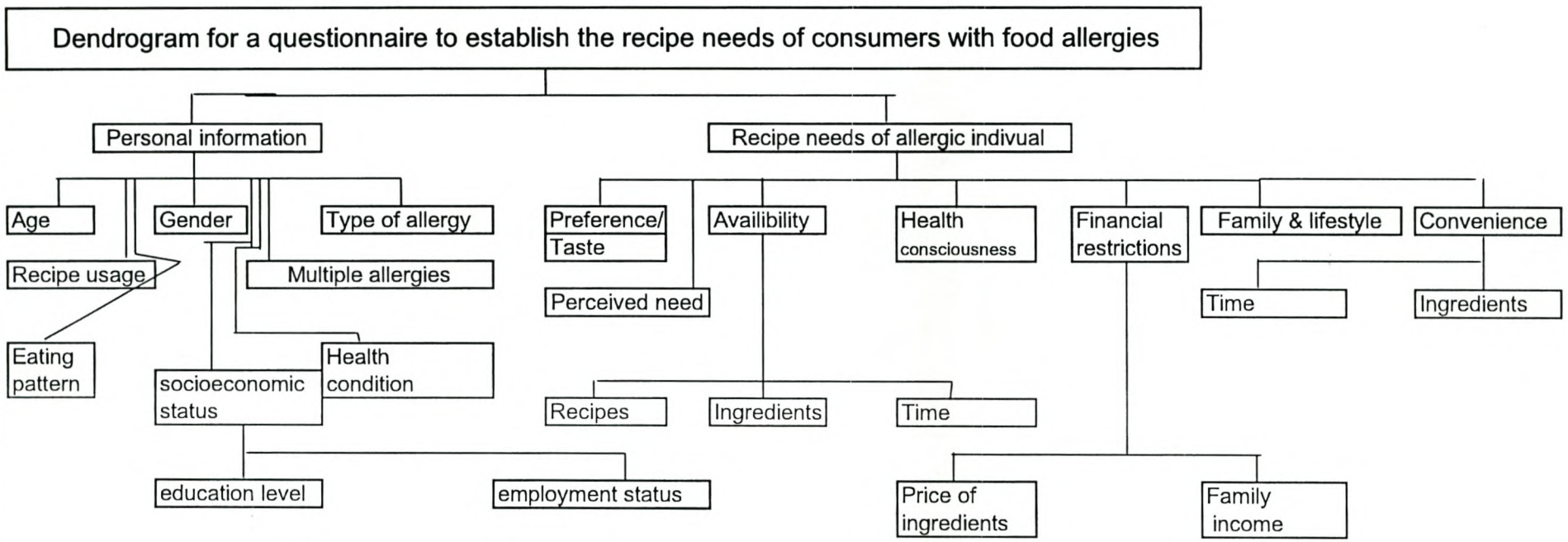
ADDENDUM 2

Addendum 2. Dendrogram for questionnaire development (see Chapter 3, Section 3.4.1.1)



ADDENDUM 3

Addendum 3. Draft questionnaire (see Chapter 3, Section 1.4.1.1)

FOOD ALLERGY QUESTIONNAIRE

The questionnaire is to be completed by the caretaker of an food-allergic child between the age of **2 and 18 years**. The information on the questionnaire will be **confidential**. The researcher thanks you for your co-operation and willingness to help.

SECTION A: PROFILE OF THE FOOD-ALLERGIC PERSON

1. What is your relationship to the person with the food allergy?

Myself	1
I am the mother	2
I am the father	3
I am the grandmother	7
Other (Please specify: .....)	8

Questions 2 to 6 pertain to the person with the food allergy. If you are the one with the allergy, these questions pertain to you. If you accompany the allergic person please answer the questions on behave of the allergic person

2. What is the gender of the allergic person?

Male	1
Female	2

3. How old is the allergic person?

_____

4. (a) Were the allergic person breastfed?

Yes	1
No	2

4. (b). If yes, until what age?

1 month	1
2 months	2
3 months	3
4 months	4
5 months	5
6-9 months	6
10-12 months	7
Longer	8

5. What food allergies apply to the allergic person? (Please mark ALL that apply)

Wheat	1
Milk	2
Soya	3
Egg	4
Legumes	5
Other (Please specify: .....)	6

6. (a) Does the allergic person eat the same food than the rest of the household?

Yes	1
Sometimes	2
No	3

(b) Please explain your answer in Question 5(a) [If **yes or sometimes**, be more specific. If **no**, why not?]

.....

.....

7. (a) On average, how many meals does the allergic person have per day?

.....

(b) How many of those meals are taken at home?

All of them	1
Most of them	2
Half of them	3
Less than half	4

SECTION B: DISEASES AND FOOD ALLERGIES IN THE HOUSEHOLD

8. Does the allergic person or anybody in the household suffer from any of the following diseases?

Disease	**Yes**	**No**
(a) Obesity	1	2
(b) Diabetes	1	2
(c) Constipation	1	2
(d) High cholesterol	1	2
(e) High blood pressure	1	2
(f) Arthritis	1	2
(g) Other (Please specify: .....)	1	2

9. (a) Do any of the other family members in the allergic person's household also have a food allergy?

Yes	1
No	2

(b) If **yes**, which of the following food allergies do the other family members suffer from? (Please mark ALL that apply.)

Wheat	1
Milk	2
Soya	3
Egg	4
Legumes	5
Other (Please specify: .....)	6

SECTION C: ALLERGY FREE RECIPES AND FOOD TYPES

10. On a scale of 1 to 7, please rate your experience of the **availability of allergy free recipes:**

Very easily available	1	2	3	4	5	6	7	Totally unavailable

11. (a) Do you use allergy free recipes?

Yes	1
Sometimes	2
No	3

(b) If **yes** or **sometimes**, where do you find allergy free recipes?

.....
.....
.....

12. (a) Do you know of a recently published allergy free cookbook?

Yes	1
No	2

(b) If **yes**, please specify the title and author:

.....
.....

13. What type of allergen-free recipes do you **prefer** or do you think is **insufficient**?

Type	**Yes**	**No**
(a) Breads and muffins	1	2
(b) Cakes and frosting	1	2
(c) Cookies	1	2
(d) Snacks	1	2
(e) Main meals	1	2
(f) Light meals	1	2
(g) Vegetable dishes	1	2
(h) Vegetarian dishes	1	2
(i) Sweets	1	2
(j) Drinks		
(k) Other (Please specify: ....)	1	2

14. What type of allergen-free recipes do you experience as **insufficient/lacking**?

Type	Yes	No
(a) Breads and muffins	1	2
(b) Cakes and frosting	1	2
(c) Cookies	1	2
(d) Snacks	1	2
(e) Main meals	1	2
(f) Light meals	1	2
(g) Vegetable dishes	1	2
(h) Vegetarian dishes	1	2
(i) Miscellaneous	1	2
(j) Other (Please specify: ....)	1	2

15. (a) Please rate how much you agree or disagree with the following statement:
The taste of allergen-free recipes are unsatisfactory.

Strongly agree	1
Agree	2
Uncertain	3
Disagree	4
Strongly disagree	5

(b) If you **agree** or **strongly agree**, why is the taste unsatisfactory?

.....
.....
.....

16. (a) Do you like honey?

Yes	1
No	2

16. (b) Dou you use honey a lot?

Yes	1
No	2

17. (a) Do you try to prepare "healthy food"?

Yes	1
Sometimes	2
No	3

(b) If **yes** or **sometimes**:

- What particular health risks do you avoid?

.....
.....
.....
.....

- Why?

.....
...

.....

18. (a). Do you take any nutrient supplementations?

Yes	1
No	2

19. (b) Why do you take supplentation?

.....

.....

SECTION D: OPINION ON VARIOUS ISSUES RELATING TO FOOD ALLERGY

20. Please rate how much you agree or disagree with the following statements:	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
(a) As a result of the allergy, the household is very dependent on non-allergic food items available in shops.	1	2	3	4	5
(b) Food items for allergic persons are generally more expensive than the same food items for non-allergic persons.	1	2	3	4	5
(c) Non-allergic food items are prepared in the household for the allergic individual.	1	2	3	4	5
(d) Ingredients replacing allergic components are easy to use.	1	2	3	4	5
(e) I would like a two-week menu cycle with allergy free recipes for specific allergies.	1	2	3	4	5
(f) Most allergy free recipes are time consuming to prepare.	1	2	3	4	5
(g) Allergy free recipes are not health promoting.	1	2	3	4	5
(h) I have a lot of time available for food preparation.	1	2	3	4	5
(i) The family eat together regularly.	1	2	3	4	5

SECTION E: HOUSEHOLD DEMOGRAPHICS

21. What is the average income of the household per month?

≤R999	1
R1 000 – R4 999	2
R5 000 – R9 999	3
R10 000 – R14 999	4
R15 000 – R29 999	5
R30 000 – R49 999	6
R50 000+	7

22. Who is the "caretaker" or the person that is responsible for the food in the allergic child's household?

Father	1
Mother	2
Other (Please specify: .....)	3

23. What is the highest education of the breadwinner and the caretaker?

Education	Breadwin -ner	Caretak er
No school		1
Some primary		2
Primary completed		3
Some high school		4
Matric		5
Technikon		6
University degree		7
Other post matric		8
(Please specify: .....)		

24. What is the employment status of the breadwinner?

Employed	1
Retired	2
Unemployed	3
Other (Please specify: .....)	4

25. Is the allergic person Christion, Muslim or Jewish or of other religion?

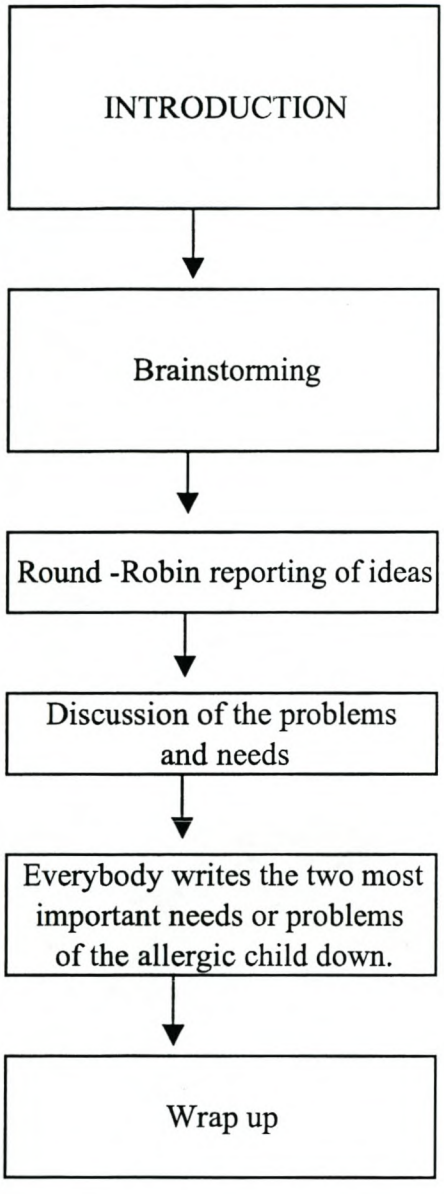
	Yes	**No**
Christion	1	2
Jewish	1	2
Muslim	1	2
Other	1	2
No religious orientation	1	2

ADDENDUM 4

Addendum 4. Focus group meeting schedule sheet (see Chapter 3, Section 3.4.1.1.

Focus group meeting, 3 &10 August 2001, Red Cross Childrens Hospital.

Meeting Schedule sheet



Explain the study
Explain the process of the focus group
Introduce : names
Explain the mentioning of all ideas untill exhausted
10 min

On their own, write down
"What are your problems or needs when feeding your allergic child?"
10 min

10 min

20 min

5 min

Tell them more about the study
Thank them
5 min

ADDENDUM 5

Addendum 5. Focus group meeting report at The Red Cross Children's Hospital

Report on visit to Red Cross Children's Hospital on Monday 3 September 2001.

Six mothers were scheduled for the focus group meeting, but due to bad weather conditions only three showed up.

The problems they identified were as follow:

Participant 1

- Potato flour are regularly out of stock
- Potato bread is hard and tasteless.
- Rice crispies is the only breakfast that is allowed.
- Difficult to keep breakfast interesting
- Soya smells and taste bad, child do not want to eat it.
- All luxury foods are restricted and common snacks like chips are difficult to replace.
- Do not want to be different from other children, they want also to eat chips.
- Peanuts are wisely disguised on labels.
- Party snacks like cakes are a big problem.
- The availability of ingredients lists on the label is not always sufficient.
- There is controversy over the allowance of carob.

Participant 2

- Difficult to find luxuries/snacks that the child may eat.
- Toppings on bread are a problem.
- Tired of only allowed to drink apple juice.
- Snacks to take to school are difficult to manage.
- Party foods like cakes are a problem.
- Maltebela has no list of ingredients on the label.
- Health shops are out of reach.
- Speciality breads are expensive.
- At parties the other mothers are not conscious of the problem.
- Gatti's sorbet is allowed for the cow's milk allergic child.
- Soya milk tastes awful.
- Plenty of time is spent in shops reading labels.
- It costs around R500 to feed one (allergic) child; large amounts of the money for groceries are spent on the allergic child.

Participant 3

- Need egg free recipes
- Soya-based products not easy to find.
- Cereals must be made more interesting
- Bread although wheat free can still cause a problem
- Potato bread is boring to child – she needs a variety.
- Health shops are expensive.
- Some bread cannot toast.
- Oats bread that is available in shops contains peanuts and other ingredients that the child is not allowed to eat.
- Child is teased due to her eating habits.
- Strawberry Nesquick and Ricoffy caffeine-free coffee is allowed.
- Difficult to bake cake without egg.

Addendum 5: Focus group meeting report at The Red Cross Children's Hospital. (continued)

Report on visit to Red Cross Children's Hospital on Monday 10 September 2001.

Ten mothers of allergic children were scheduled for the meeting. Due to poor weather conditions only two mothers turned up.. They felt that they were coping very well with the feeding of their allergic children. The two children's profiles are as follows:

Participant 1
8 years old Christian boy
Allergic to peanuts, egg, soya, legumes & spices.
Breadwinner's average income R5000 – R9999

Participant 2
13 year old Muslin girl
Allergic to tree and ground nuts, egg, dairy, wheat, fish, banana, avocado
Breadwinner's average income R5000 –R9999

The problems that they identified were as follows:
Participant 1

- Family's main complaint is that they prefer to eat fish but are not allowed to enjoy it because Malieka is allergic to it.
- To treat the other children with sweats and nice food is difficult, so they have to wait until Malieka is not at home.
- The foods that are permitted are expensive.
- Home-made custard has tartrazine, while premade custard is tartrazine-free but more expensive.
- Advancing into puberty improved symptoms of food allergy, e.g eczema.
- She is a shy girl because of her bad appearance.
- Rice milk is to expensive to buy, so milk is totally omitted.

Participant 2

- Preservative-free foods are difficult to find
- Bovril, Milo, Neslé and most spices contain soya
- Rice and potato flour give a "heavy" bread
- Soya is difficult to see on labels.

After the meeting another lady with her food allergic child was seen. She bring her child to Red Cross Children's Hospital from birth. Her profile is as follows:
Participant 3
11 year old Muslim girl
Allergic to wheat, kiwi, niknaks, peanut butter, egg, milk, oranges.

Participant 3 identified the following problems:

- Difficult to avoid white flour
- The child steals to eat like the other children.
- Very self-concious
- Difficult to bake bread every day and to avoid cakes
- Family compliance is difficult.
- She is not health consciouss

ADDENDUM 6

Addendum 6. Docters information used to obtain food allergic children (see Chapter 3, section

Doctor	Field	Telephone	Fax/e-mail
Voigt	Medinet	5576112	
Van Zyl, J	PATH		
Alexander, R	PAED	9300825	
Zieff, S	PAED	4240237	5952120 (Thurs)
Weber, HC	PAED	9491450	
Malan, F	ENT	9305113	
Pohl, F	PAED		
Wewege, A	PAED	7972087	
Jacobs, P (Prof)	PHYS	7992569	
Conradie, JD	GP		
Berlyn, PJ	PAED		
White, P	PAED		
Smit, W	PAED	9750035	
Louw, WG	ENT	9497836	
Adams,OF	PAED		
MC Given, AJ	PAED	9461735	
Omar, M	PAED	6991321	
Hugo-Hamman, C	PAED	7976112	7622160
Williams, MF	PAED	6379156	
Wicht, CB	PAED	5311222	
		4233333	
Pienaar, AC	PAED		
Von Delft	PAED	8512595	
Esterhuizen, K	ENT	7978153	
Du Plessis, HHJ	PAED	9481751	
Lund, JO	PAED	7972087	
Vermeulen, J	PAED	9300630	
Midgley, I	GP	7131414/6	
Jedeikin, L	PAED	5317261	
Theron, R	PHYS	9751583	
Webster, IK	DERM	8525858	
Brussouw, H	GP	8554732	
		0825664787	

Bailey, M	PAED	7623929	
		0828811760	
Theron, R	PAED		
Dempers, P	DERM	5951826	
Docrat, ME	DERM	4233180	
		4233190	
Wessels, J	GP	8422341	
		8422361	
Zieff, T	PAED	5578480	
Swart, Z	DERM	9755070	
Raja, S	GP	3911692	
Puterman, AS	PAED	6834454	
Pretorius, P	ENT	9304430	
Jood, IP	GP		
Potgieter, TG	GP	8838047	
		0825533762	

ADDENDUM 7

Addendum 7: Correspondence with medical doctors

19 October 2001

Dear Doctor

Research for Master's study on the allergic child

Your practice has been identified as one who does referals for food allergies in order to get to root causes. We also would like to contribute to the issue of food allergies through a Master's study pertaining to recipes for the allergic child. If you require the protocol for the study we will only be to pleased to fax this.

The Faculty of Medical Sciences,US has given ethical approval of Miss Suzette Matthee's study and we will appreciate your co-operation – else her study will not progress as anticipated. However, we realise you are busy and do not know how we can adequately thank you if you will be willing to co-operate in the following manner:

- We will only be looking at the egg, wheat, milk and soya allergic child between the ages of two and eighteen years, with **children having more than one allergy excluded** from the study.
- For the first phase of the research we will be working with **the caregiver** in view of conducting focus groups.
- For this purpose we **will require the street addresses of the caregiver and the phone number**.
- If you were willing to inform the caregivers of our research and that they could expect a call from us, we will appreciate it, but it is not essential. (We will request written consent by the caregivers to co-operate and will ourselves explain the study and benefits thereof.)
- Will you kindly fax to Mrs Bonnie van Wyk, who is our research assistant, for my attention, a list of the caregivers who will qualify for the study. Her fax / phone number is 021-8800829.

Thank you once more for your time and co-operation.

Yours sincerely

(Dr) Charlyn Vosloo

Addendum 7: Correspondence with medical doctors

6 November 2001

Dear Doctor

Research for Master's study on the allergic child

Your practice had been identified as one who does referals for food allergies in order to get to root causes. Initially when we requested your co-operation in a letter dated 19 October, we were optimistic about finding large numbers of allergic children. This has not been the case. We ascribe the poor response to the limitation set up in our research, namely only looking at a single allergy per child. Now we have decided to look at the egg, wheat, milk and soya allergic child between the ages of two and eighteen years, with **children having more than one allergy INCLUDED** in this study. Our other requirements remain the same:

- We **will require the street addresses of the caregiver (e.g. mother) and the phone number**.
- If you were willing to inform the caregivers of our research and that they could expect a call from us, we will appreciate it, but it is not essential. (We will request written consent by the caregivers to co-operate and will ourselves explain the study and benefits thereof – if you will be happy with this arrangement.)
- Will you kindly fax to Mrs Bonnie van Wyk, who is our research assistant, for my attention, a list of the caregivers who will be interested in becoming involved. We plan to finish this part of the study by the first week of December. It will only entail one meeting per group and the meeting will be scheduled for a time (two hours) that will be convenient. No further commitments will be expected from the caregivers.
- Obviously, these dates are dependent on the feedback and support we will be receiving from you. As we require a week for the arrangements to be made by phone, could we kindly request your response as soon as possible?

If you have any questions, my phone number is 082-5588-731, and Mrs Bonnie van Wyk's fax / phone number is 021-8800829. We will be so grateful for your attention to this matter

Yours sincerely

Charlyn Vosloo

ADDENDUM 8

Addendum 8. Correspondents with newspapers, see Afrikaans article below.

14 November 2001
Redaksie
Streekskoerant

Geagte Mnr/ Me

Respondente in 'n studie oor Voedselallergieë benodig

'n Magisterstudent aan die Universiteit van Stellenbosch benodig hulp met navorsing. en wil die betrokkenes wil vriendelik vra om die artikel wat voorberei is, in u koerant in die eerskomende uitgawe te plaas met die oog op respondente vir die bogenoemde studie.

Voedsel-allergiese kinders benodig

'n Magisterstudent, Suzette Matthee, van Departement Verbruikerswetenskap, US, is tans besig met navorsing op kinders tussen die ouderdom van 2 en 18 jaar wat allergies is vir een of meer van die volgende naamlik, grane, melk, eiers of soja.

Die doel van die navorsing is om die behoeftes van medies-geïdentifiseerde voedsel-allergiese kinders te bepaal en dan daarvolgens 'n tweeweeksiklusspyskaart op te stel wat nie net in die behoeftes van die allergiese kinders voorsien nie, maar ook gesond en interessant is.

Die probleem wat baie ouers van voedsel-allergiese kinders ondervind, is dat die kinders verveeld raak met die voedselsoorte wat hulle mag eet en dat die kinders graag "normale" voedselgeregte, bv. by partytjies - soos koek, wil eet. Dit is egter moeilik indien die kinders vir een van bogenoemde allergies is. Die resepte wat beskikbaar is, is ook meestal oninteressant en redelik onsmaaklik.

Suzette se projek poog om al hierdie kwessies en nog meer aan te spreek. Sy benodig egter insette van allergiese kinders sowel as die moeder. Indien u van kinders weet wat allergies is vir graan, melk, eiers of soja, en wie se moeders bereid sal wees om te help met die navorsing, u so vriendelik sal wees om Suzette te bel by 082 8737472 of 021-8832522; as dit kan, asseblief voor 24 November 2001.

Die deelnemers sal vergoed word vir hulle hulp en samewerking.

Indien u nie ruimte het vir die artikel nie, is ons bereid om 'n advertensie te plaas. Ons glo egter dat u die saak goedgesind sal wees en ons sal help om die koste van die studie te besnoei terwyl ons ook vir lesers uit u omgewing 'n waardevolle diens kan lewer. Die advertensie voorsien egter minder inligting - so ons vermoed die respons sal swakker wees:

ADDENDUM 9

ADDENDUM 9: DETAILED REPORTS ON THE FOCUS GROUP MEETINGS.

The three focus group meetings had the same schedule and the same questions were posed at the three meetings, but as the meetings were conducted more information was retrieved. Meeting three is therefore the most complete.

Report on Focus Group Meeting held on 5 December 2001.

Venue: Suiderkerk in Paarl

Time: 15h30 to 18h30

Moderator: Dr De Wet Schutte.

Participants: Five participants attended the meeting.

Dr Schutte firstly explained to them the objectives of the focus group meetings and that it is an open discussion among themselves and that he would only facilitate the flow of the discussion. He asked them to talk out of their own experiences as caregivers of allergic children and that of other people they know with the same problems in mind.

The discussion started with **what foods they usually have in their homes**. The answers were quite similar for all the caregivers, namely, milk, cheese, butter, eggs, bread, cold meat, cake flour, cooldrink, porridges and fruit and vegetables.

They were then asked **if they were health conscious**. They all had fresh fruits and vegetables in the house and one said she never had *Coke*, chips or ice cream in the house. One said that in the same household it was possible to have both health conscious individuals, as well as people that were not health conscious. Most of them saw sweets as unhealthy. Two said they removed all the fat off the meat as well as the skin before food preparation. One then replied that you had to cook it with fat and skin but not eat the fat and skin. If the fat and skin was removed after preparation and not before the taste of the prepared food was better than cooking without skin and fat. All of them looked out for fats due to cholesterol problems of either the partner or parents. Some are also careful for diabetes, high blood pressure and heart disease depending on the family history. Two said it was difficult to be health conscious if the husbands did not care. One also said she tried to avoid sugar and fats

The question whether, **when you woke up in the morning, you knew what you would eat that day**, was answered in different ways. One said she bought that day's food on the particular day and did not know what she would eat the next day. Another two said they only knew what was for breakfast and in the evening - when they got home - they would decide what was for dinner. Another said coloureds have fish on Monday and sausage on Friday; where one said 'and meatballs on Wednesday' and that was all that was planned. Some said she went to do her shopping once a month and then she looked what was available and prepared food. They bought their fresh products every other or third day.

On the **recipe book** issue, one said she sometimes looked in recipe books for some sort of inspiration and then prepared her own meal. Three said they did not use recipe books but one confessed his wife had six recipe books and would look in them when she was baking cake. Another said she only used a recipe book

to look-up ways to spice food. Some only used a recipe book when they wanted to prepare something special.

When **asked if healthy food was important to them** they all said they would eat vegetables daily, some said they tried to cook without butter or oil as well as sugar. The question if the composition of food on the plate was important one answered she would look at colour, taste and texture. She said a balanced plate consisted out of a starch, vegetables, and meat without fat and brown rice. One participant said potato should be eaten whole and not mashed, mashed it is less healthy. They all confessed they knew about food groups but they did not use the system. They cooked spontaneously.

The focus shifted to the allergic child. **Did the allergic child influence the pattern of food preparation?** One said if it was only an allergic child in the household she would never stock milk and would prepare healthy food with lots of vegetables and little oil. Another said that the allergic child had no effect on their household because the child only drank milk and rooibostee. One said they would eat more ice cream if it was not for the allergic child but for the rest, the child adopted their "normal" eating pattern. Another said they practically ate the same but things were omitted from her plate. Some said she taught her son self-discipline. He was not allowed to have all the things in the house, but she bought everything.

When asked **what they thought were the difficulties for the allergic child**, some said that the child felt different. They want things they were not allowed to get. One said she told her child how many children were allergic and he should not feel different. Another said she also thought the excema and constant closed nose made them frustrated and then they ate wrong food and felt even worse afterwards. Another one said her daughter felt bad that she made it difficult for the family and she really missed bread.

When asked **for them as parents what was the hardest part**, one answered that the child was embarrassed by her condition, she was ashamed of her skin, excema and blocked nose. Another said that the child had no feeling of responsibility; he did not feel bad or sorry when he had eaten something wrong. One said the constant fighting between father and son whenever her child ate something wrong. The father would scold a lot. Some said the fact that they could not eat out or go to friends without worrying. Another said they advertised all the nice products on television and said that it was healthy. Thereafter the children desperately wanted the product but they were not allowed to get it.

When asked **if they use allergy-free recipes** all of them said no. When asked if they thought their children ate healthily, most said they thought so but one said his daughter 'did not eat at all' and another said due to the fact that her child was a teenager she 'did not eat healthy either.

On the issue of **food preparation** they were asked if they only wanted the food to be acceptable or healthy? One had the problem with his child that she 'did not eat at all', so he answered as long as she got some food in her body he was happy. The rest of the participants all said they wanted the food to be healthy but they did not always succeed in that. Some said sometimes they just did not care as long as the children ate. The discussion moved on to hot chips, "the only food all food-allergic children can eat and loved".

Are they label conscious? One said things like vienna sausages did not have a label and then you must know that the child could not eat it. Another said her daughter is more label conscious - between the two of them, every label was read. One said she may be a bit irresponsible but she only reads some labels, especially those she wonders about, but her allergic daughter does most of the shopping so she probably looks. They said that dark chocolate and cooking chocolate was not made from milk but from soya.

On the **recipe** issue it was clear that they did not like to prepare food from recipes because they complained that mostly all the ingredients in recipes were not in the house at the time of preparation. One said that when she tried to improvise on the recipes, they usually did not come out right. Another also said recipes were too complex and expensive. They all then returned to the fact that the ingredients should be in the house. One also said it was a risk to try a new recipe book because you did not know if the recipes would work and if the prepared dish is appetising. One said she wanted it to be simple, on that point everybody agreed.

If they had tips to give to other food-allergic parents what would that be?

- Treat the allergic child just like the other children.
- Be sensitive to the allergic child's needs.
- *Propelus Kid* is a homeopathic remedy that worked against allergic reactions and increased the immunity of the child.
- Use an Iron supplement.
- Try to accommodate the child by trying to fit into his pattern.
- Do not take your allergic child along when going shopping.

Report on Focus Group Meeting held on 6 December 2001.

Venue: Department of Consumer Science, University of Stellenbosch

Time: 16h30 to 18h00

Moderator: Dr De Wet Schutte

Participants: Five participants out of the scheduled seven attended the meeting. Both women that did not come cancelled half an hour before the meeting.

Dr Schutte explained the purpose of the focus group meetings to the participants. He told them that the meetings would take the form of open discussions, which he would facilitate. He asked the participants to share their own experiences as caregivers of allergic children and those of others with the same problems.

The discussion started with **what foods they usually had in their homes**. All the caregivers mentioned milk, cheese, butter, eggs, bread, potatoes, rusks, cake flour, sugar, salt, porridges, oil and fruit and vegetables. Some of the women also said they always had polony in the home, while two said they never had polony in the home.

The next question was **if they were health consciousness**. The participants initially stated they are not really health conscious and that their parents were more health conscious then they were. Most said they would at least try to boil vegetables rather than fry them and to eat fresh fruit and vegetables, if possible, but they did not take the skin off the chicken when they prepared it. One participant then said she thought she was health conscious; she tried to prepare a balanced meal every day. What they further understood to be a balanced meal was that meat was healthier when it was fresh. They also said that the preparation time and budget influenced the healthiness of their daily meals.

Mainly, the participants said they tried (to be health conscious), but did not know if they were successful. They all also confirmed that due to the allergic child they had become more health conscious than before, because they had to read all the labels of the foods they bought.

All the participants **read food labels** firstly to identify the brands they knew, because taste was very important to them, and secondly to identify the ingredients in the foods. Most also confirmed that they only read the labels of the already identified "problem" foods.

The next issue that was discussed **was whether when they woke up in the morning, they knew what they were going to eat that day**. Half of them said they planned a week ahead, because they only went shopping once a week. They did not necessarily know that they would eat fish on Mondays, but they knew they would eat fish once a week. The others said they looked at what was available in the home and then prepared the meals accordingly. One said they ate according to a strict budget, which meant they could not eat protein every day, but knew what meat was available for the week. None of them worked according to a menu cycle.

Some also said the time **available to prepare meals** was important. On days that less time was available for food preparation, quick meals needed to be prepared. One also said that if only a few members of the family were going to enjoy the meal, less effort was put into preparing it.

On the issue of using **recipes**, one participant stated that she only used recipes when she wanted something different or special. Most of the participants agreed. Another said she sometimes just looked at some recipes for an idea and then prepared her own food. Someone else said she did not like recipes because the ingredients were often too exotic and not readily available in her home. Another said the people she knew mostly wanted plain, normal food and not the exotic things in recipe books. Someone else stated that when the allergic child had to eat something special or different she was usually scared because she never knew what would happen.

The focus of the discussion then moved to the allergic child. The participants were asked **what they thought was the worst for the allergic child.** Most said they thought the symptoms of the allergy, namely itching, a runny nose and eczema. One said she thought it must be that other children were allowed to eat things that the allergic child. She said the allergic child felt different, as though there were something wrong with her. They all agreed that parties were difficult because the child was not allowed to eat most of the "nice stuff". One participant said she usually packed a bag of "goodies" for her allergic child to take to the party and informed the other mother (hostess). Another said she felt she could not do that.

One said that allergic children did not have a big appetite because they were used to not being allowed to eat everything.

One stated that her child had remarked some time ago, that she wished they could develop a device that would tell you whether or not you could eat the ingredient if you put it into the food.

One also said she kept a container full of nice things for her son at the school and whenever the other children had something nice, his teacher gave him something from his container.

All the participants stated that they did not place social restrictions on the children, such as keeping them away from parties, just because they could not have the same food as the other children, because they still enjoyed playing and socialising at the parties.

One said that people were usually more than happy to help when their co-operation was needed, for instance at parties. One said that when eating out it was better to go to a known restaurant and order plain foods – chips were always a hit! Another said her family had simply decided never to eat out again; they would rather treat themselves in a different way.

The participants were then asked **what they, as parents, felt the difficulties were of having a child with a food allergy**. One said she was concerned for her daughter's health. Some stated that the child could never do anything spontaneous but had to read and think about everything she ate all the time. Another said the financial implication of an allergic child was enormous. Medical bills were sky-high. Another said what frustrated her was that not everybody could eat the same, she always had to prepare two sets of meals.

Most said the rest of the family did not eat the food that the allergic child ate, so the allergic child had to fit in with the rest of the household. One said that her family tried as far as possible to accommodate the pattern of the allergic child. All agreed that what happened when food was prepared was that one plate was prepared separately from the others but mostly with more or less the same permitted ingredients.

Another said eggs could usually be substituted with yoghurt. She had bought an egg-free recipe book, but usually prepared food using the experience acquired by trial-and-error.

One said a problem she encountered was that there was **regular conflict in the household** due to the allergic child. The child would throw a tantrum because he also wanted the food that the other children were allowed to eat. And if that particular food was not given to the other non-allergic children, they became angry. Furthermore, this often led to arguments between the parents themselves because one parent usually felt that if the allergic reaction was not too serious the child could have a small helping of the food, while the other would scold the allergic child. The other participants to some extent agreed with this comment.

The next question the participants were asked was whether **the allergic child ate healthily in spite of the problem**

They all began by saying they thought so. One participant said she tried to boost the child's immunity by giving a vitamin supplement and many vegetables. Most of them tried to give some kind of supplement. Another cautioned that if the child ate a lot this did not necessarily mean the child ate healthily. As the discussion continued all agreed that they were afraid that their allergic children might not be eating too healthily. They were then asked **if they took the food groups into account when planning a meal.** At first, nobody answered and then they all shook their heads. One said in the beginning, after the child had been diagnosed, the main goal had been to get food into the child's body and only later was attention given to the health aspect. Some said they had tried from the beginning, while most said they were not trying at all.

The last question to be discussed was **what the problem was with available recipes**. According to the participants, there were only a small number of allergen-free recipes available and of those, many did not work. Things like egg-free rusks did not exist. The recipes contained unknown ingredients and ingredients that were difficult to obtain. Furthermore, the recipes were too long and complicated. All the participants said they usually used recipes only as an idea-generating tool. One participant said she hated it when she tried a recipe and it did not work. As the discussion continued, one said the financial implication of buyind

additional ingredients had to be taken into account as well as the fact that time available to prepare the meals was limited.

Finally, the participants were asked to give some tips to other parents with food allergic children. They suggested the following:

- Find out what is causing the allergy and avoid the allergen.
- Most people are totally ignorant about food allergies.
- Tell everybody your child has a food allergy.
- Do not take your child to a coffee shop, they feel "out" - there is nothing for them to eat there.
- Accept the condition.
- Keep the child optimistic. Do not make a fuss about the condition.

Report on Focus Group Meeting held on 11 December 2001.

Venue: Department of Consumer Science, University of Stellenbosch

Time: 15h30 to 19h00

Moderator: Dr De Wet Schutte

Participants: Eight of the scheduled ten participants attended the meeting.

Dr Schutte explained the purpose of the focus group meetings to the participants. He told them that the meetings would take the form of open discussions, which he would facilitate. He asked the participants to share their own experiences as caregivers of allergic children and those of others with the same problems.

The discussion started **with what foods the participants usually had in their homes**. All mentioned milk, bread, cake flour, porridges, oil, meat, rice, coffee, tea, pasta, "container"* foods, biscuits, jam, sweets, cool drink. Some said they always had yoghurt, chips and peanuts in the home while others said they seldom had those . One participant had a baby in the house and she always had baby food, as well as Purity in the house.

The next question was **if they were health conscious**. At first, the participants seemed reluctant to answer but they all eventually said no. The next question was whether they were **eating a balanced diet**. One said she did not have a weight problem so she ate just what she wanted, while another said she sometimes went to the gym so she felt okay about her position. Some said they ate a lot of fresh fruits and vegetables, so they felt they ate healthily. Another said they tried to avoid eating milk and butter. All the participants knew about food groups, but confessed they did not follow the guidelines. Nevertheless, nobody felt they were being irresponsible about their health. The question **when the decision was taken on what to have for dinner** elicited various responses. Some said they made that decision during the course of that day. One participant followed a set pattern, fish on Mondays, a mince dish on Tuesdays, chicken on Wednesdays, and sausage on Fridays. She only bought food once a week. Most of the other participants also ate fish on Mondays. One always had the basic ingredients in the house and just bought meat weekly; she did her weekend shopping separately.

When preparing meals, did they ever think of food groups or health? One participant said she usually decided what she would prepare half an hour before going home. Health or food groups played no role in the decision. Another said she usually prepared a stew to incorporate the vegetables that the children did not like to eat. Another said she did not bother to prepare vegetables every day, as long as they ate relatively healthily over a period of a week. Many agreed with this statement. Some said they were relatively health conscious.

Everybody stated that the amount of time available to prepare food as well as the foods available played key roles in determining what would be prepared.

Did they use recipes? One said only when very special people came to visit, no more than once a month. Another said only when her husband wanted to eat something special; he had a heart condition and she had to prepare something healthy, yet nice. Another said she sometimes used recipes but only for meat and potato dishes and sauces. However, all participants used recipes when baking cake. None of the participants used recipes to prepare dishes for their children. One said she had used recipes when her son was small, but he had not liked the food. According to her, it had really tasted awful. Two said soya milk was also very unpleasant.

How would their eating pattern change once the allergic child was out of the household? One participant said life would be easier. Another said she would then be able to fry fish** without sending someone out of the house. Some said they prepared food separately so they would then be able to prepare one meal. One participant said she could stop worrying about sending food along when the child went to visit other people. Another said she was always afraid when her child went to parties.

When asked what they thought the child found most difficult, most said the fact that the child was not allowed to eat what he/she would like to. As the child grew older, that became an issue. One said the child disliked going out or attending school functions. Some participants had the same problem. One said it was difficult to keep her daughter out of the sun, as she reacted to the sun as well. Another's child hated going to doctors and hospitals after all the tests.

To them as parents, their main problem was, that they had to refuse their children certain foods. Two felt pity for their child's appearance. None of them had any problem with the preparation of the food.

In answer to the question **when children started making their own decisions on what to eat,** one said her son was starting now and he was seven. Two said at age eight. Another said her daughter was thirteen and still sometimes cheated.

None of them had any problem shopping with their children.

They were also asked **if there was sometimes conflict in the home due to the food allergy**. Two said no, the other children had to adapt to the allergic child. Most of the others said they all ate together but one said her child was only allowed to eat some foods, so she ate alone. It was clear that the family's diet was structured around the allergic child.

What did they look for when preparing a meal? Apparently they looked for colour, texture and appearance. All of them agreed that it was most important for the food to look appetising. One also said he insisted that the food had to be the right colour, for instance, broccoli had to be green. Another said care had to be taken that all the vitamins were not cooked away.

One participant said that she did not know what she could give to compensate for the calcium that was lost by not having any dairy in the diet.

When asked **if they thought the children ate healthily,** one said she thought as babies the allergic children ate more healthily than normal healthy children did. After the discussion, it was apparent that everybody's children ate relatively healthily, but that there was room for improvement. One participant said she had a problem with the skin creams they gave the children because they made their skins thin. Someone said they would rather just avoid some things than to try and find replacements, because it was so much easier and safer.

To the question from **where they got their knowledge and how they knew what to do**, the answer was from doctors and dieticians but mostly by trial-and-error. One said there was little written information on food-allergies. Everybody else agreed.

All were **label conscious,** but knew every little about "hidden allergens" and found that a problem.

The participants suggested the following tips for other parents:

- Avoid the foods that the child is not allowed to eat.
- Do not look at what they may not eat, look at what they may eat.
- Listen and talk to people.
- Do not always try to fix the symptoms, try to prevent them from occurring.
- Try to establish the cause of the allergy.

*"Container" foods include bottle, canned and tinned foods.

**Her allergic child was allergic to milk, as well as fish.

ADDENDUM 10

ADDENDUM 10A: RECIPES FOR THE MAIN MEAL OF THE TWO-WEEK MENU CYCLES FOR THE FOUR RESPECTIVE HOUSEHOLDS.

Lemon and rosemary chicken (*Woolworths*, [s.a]:68). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
chicken drumsticks	800.0	60.63%	800.0	60.63%	
oil	60.0	4.55%	60.0	4.55%	
garlic cloves, crushed	6.0	0.45%	10.0	0.76%	
lemon rind, finely grated	10.0	0.76%	6.0	0.45%	
rosemary, freshly chopped	25.0	1.89%	25.0	1.89%	
cake flour/potato flour	12.5	0.95%	12.5	0.9%	Potato flour replaces the cake flour for the wheat-allergic child.
chicken stock	375.0	28.42%	375.0	28.4%	
lemon juice	25.0	1.89%	25.0	1.9%	
salt	3.0	0.23%	3.0	0.2%	
black pepper	3.0	0.23%	3.0	0.2%	
Total	1319.5	######	1319.5	100.0%	

Method:
With a sharp knife, make two deep cuts in the thickest section of each drumstick.
Melt oil in a large, heavy-based pan, add drumsticks. Cook over medium heat for 5 min on each side or until brown. Add garlic, lemon rind and rosemary.
Blend flour* with stock and lemon juice in a small bowl or jug, until smooth.
Add to pan and bring to boil. Reduce heat and simmer, covered, for 15 min or until drumsticks are tender, stirring occasionally.
Season and serves immediately.

Bobotie (Human, 1984:112). Serves 4-6 (Casserole dish = 1,5 *L*).

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
onion, grated	100.0	8.6%	100.0	8.6%	
oil	22.0	1.9%	22.0	1.9%	
lemon juice	37.5	3.2%	37.5	3.2%	
curry powder	5.0	0.4%	5.0	0.4%	
sugar	4.0	0.3%	4.0	0.3%	
salt	4.0	0.3%	4.0	0.3%	
pepper	2.0	0.2%	2.0	0.2%	
mince meat	500.0	42.8%	500.0	42.8%	
white bread slices, thick	30.0	2.6%	30.0	2.6%	Wheat-allergic child use *French Connection Vita Rye*.
milk/soy milk	250.0	21.4%	250.0	21.4%	The cow's milk allergic child uses soy milk; the soy-allergic child must use the original recipe.
eggs	200.0	17.1%	200.0	0.0%	See replacements below for egg-allergic child.
chutney	10.0	0.9%	10.0	0.9%	
lemon leaves (optional)	3.0	0.3%	3.0	0.3%	
Total	1167.5	100.0%	1167.5	82.9%	

Method:
Preheat the oven to 180°C. Fry the onions and mince in oil until brown.
Mix the lemon juice, curry powder, sugar, chutney, salt and pepper and add to onions-mince mixture.
Soak bread in milk. Press most of the milk from bread, but keep the remaining milk.
Blend the bread until fine. Add to the mixture.
Grease the 1,5 *L* oven-pan with oil.
Put the mixture into the casserole.
Beat the egg and milk together and season. Pour over the mince base.
Press the lemon leaves into the bobotie.
Bake for 30 min.
Replacement: for **egg-allergic** child:
Replace the 200 g egg with 70 g smooth cottage cheese and 130 g thin white sauce. Add to the remaining milk (see above).

Grilled chicken kebabs with gremolata (Myburg, 2000:55). Serves 6 kebabs.

Ingredients	Original recipe		Adapted recipe		
	g	%	g	%	Reason for change/ingredient
chicken breasts	800.0	68.4%	800.0	68.8%	
lemon zest	20.0	1.7%	20.0	1.7%	
lemon juice, fresh	60.0	5.1%	60.0	5.2%	
lemon thickly sliced and cubed	90.0	7.7%	90.0	7.7%	
oil	110.0	9.4%	110.0	9.5%	
origanum/dried herbs	8.0	0.7%	8.0	0.7%	
white wine vinegar	15.0	1.3%	15.0	1.3%	
baby bay leave halves	6.0	0.5%	0.0	0.0%	Omit from recipe, it's too expensive and not generally found in households.
salt	5.0	0.4%	5.0	0.4%	
black pepper	5.0	0.4%	5.0	0.4%	
gremolata:					
garlic cloves, crushed	10.0	0.9%	10.0	0.9%	
lemon zest, grated	20.0	1.7%	20.0	1.7%	
parsley, chopped	20.0	1.7%	20.0	1.7%	
Total	1169.0	100.0%	1163.0	100.0%	

Method:
Cut the chicken into chunks in order to have 5 large cubes per kebab.
Marinate the chicken cubes in the remaining ingredients, excepting the ingredients for the gremolata, in a glass bowl for at least 3 hours, or even overnight.
Thread the chicken and lemon pieces onto soaked skewers.
Grill the kebabs until the chicken is cooked through, about ten min on each side.
While the kebabs are grilling, combine the ingredients for the gremolata. Reduce the remaining marinade.
Drizzle each kebab with a little of the reduced marinade and sprinkle with the gremolata during grilling.

Vegetable lasagne (Lategan, 2000:76). Serves 8.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oil	18.0	0.7%	18.0	0.7%	
onion, chopped	100.0	3.7%	100.0	3.8%	
garlic, chopped	8.0	0.3%	8.0	0.3%	
carrots, coarsely grated	300.0	11.1%	300.0	11.5%	
green sweet pepper, seeded, sliced	100.0	3.7%	100.0	3.8%	
red sweet pepper, seeded, sliced	100.0	3.7%	100.0	3.8%	
brinjal, washed, cubed	300.0	11.1%	300.0	11.5%	
celery sticks, diced	50.0	1.9%	50.0	1.9%	
mushrooms, sliced	125.0	4.6%	125.0	4.8%	
whole tomatoes and juice (tinned)	400.0	14.9%	400.0	15.3%	
tomato and onion mix (tinned)	410.0	15.2%	410.0	15.7%	
mixed herbs, dried	8.0	0.3%	8.0	0.3%	
dried parsley	8.0	0.3%	8.0	0.3%	
salt	3.0	0.1%	3.0	0.1%	
black pepper	3.0	0.1%	3.0	0.1%	
oil	50.0	1.9%	50.0	1.9%	
cake flour/potato flour	25.0	0.9%	25.0	1.0%	Potato flour replaces the cake flour for the wheat-allergic child.
salt	3.0	0.1%	3.0	0.1%	
white pepper	2.0	0.1%	2.0	0.1%	
skim milk/soy milk	400.0	14.9%	400.0	15.3%	The cow's milk allergic child uses soy milk; the soy-allergic child must use the original recipe.
cheese, grated	80.0	3.0%	0.0	0.0%	Omit for the milk-allergic child.
lasagne sheets, raw	200.0	7.4%	200.0	7.7%	Wheat-free lasagne sheets must be used by wheat-allergic child. Absorbs sauce.
Total	2693.0	100.0%	2613.0	100.0%	

Method:

Heat oil. Add onion, garlic, carrots, sweet peppers, brinjal, celery and mushrooms. Stir-fry for 10 min. Add tomatoes, juice, tomato sauce and seasoning to vegetables.
Simmer for 5 min. Set aside.
Prepare a white sauce from the oil, cake flour/potato flour, seasoning and skim/soy milk.
Grease a large rectangular ovenproof dish lightly with oil.
Assemble the lasagne as follows: spoon 1/3 of the vegetable mixture into the dish. Spread evenly,
cover with 4 raw lasagne sheets, spread another 1/3 of the vegetable mixture over the lasagne sheets,
cover with 4 raw lasagne sheets, spread another 1/3 of the vegetable mixture over the lasagne sheets,
spoon the cheese sauce over the vegetable mixture, top with the remaining 20 g grated cheese for the non-milk-allergic child.
Bake for 30 min at 180 °C.

Green beans with onion and bacon (Reader's Digest, 1990:78). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oil	30.0	3.1%	15.0	1.6%	Decrease to reduce fat percentage of recipe.
bacon, chopped	60.0	6.1%	60.0	6.2%	
onion, chopped	100.0	10.2%	100.0	10.4%	
green beans/broad beans	700.0	71.4%	700.0	72.5%	Green beans used rather than broad beans, due to availability of beans.
boiling water	80.0	8.2%	80.0	8.3%	Green beans absorbs an estimate 80 g of water.
salt	5.0	0.5%	5.0	0.5%	
black pepper	5.0	0.5%	5.0	0.5%	
Total	980.0	100.0%	965.0	100.0%	

Method:

Heat the oil in a heavy, medium-sized saucepan over a moderate heat.
Add the bacon and fry for 2 min. Add the onion and cook for 5 min. Blanch green beans in boiling water (+) for 5 min.
Immerse in ice water to retain colour.
Add the green beans and boiling water. Simmer gently for 3 min, or until the beans are tender.
If necessary, you can add little salt and pepper to taste.

Kabeljou with mushrooms (Hall, 1991:60). Serves 6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
kabeljou	1000.0	49.5%	1000.0	57.3%	
cake/potato flour	12.5	0.6%	12.5	0.7%	Added as replacement for flour for grain allergic child.
salt	2.0	0.1%	2.0	0.1%	
paprika	2.0	0.1%	2.0	0.1%	
butter	25.0	1.2%	0.0	0.0%	
oil	20.0	1.0%	45.0	2.6%	
onion, chopped	350.0	17.3%	350.0	20.1%	
mushrooms, sliced	300.0	14.9%	300.0	17.2%	
soya sauce	8.0	0.4%	0.0	0.0%	Omit for soy-allergic child.
chutney	0.0	0.0%	8.0	0.5%	
sour cream	250.0	12.4%	0.0	0.0%	Omit for milk-allergic child.
sherry	25.0	1.2%	0.0	0.0%	
parmesan/mozzarella cheese	25.0	1.2%	25.0	1.4%	Omit for milk-allergic child.
Total	2019.5	100.0%	1744.5	100.0%	

Method:

Skin and fillet fish so that pieces are in total 750-800 g. Mix flour, salt and paprika and dust fish on both sides.
Arrange in lightly oiled dish to fit really closely, but without actually overlapping.
Heat oil and soften onion and mushrooms. When just beginning to shrink, remove from stove, add soy sauce/chutney and pour over fish.
Bake uncovered, at 180°C for about 20-40 min.

Sesame seed chicken (Lategan, 1997:34). Serves 2-4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
chicken thighs	400.0	84.2%	400.0	83.9%	
mayonnaise/yoghurt/olive oil	20.0	4.2%	20.0	4.2%	Yoghurt for egg-allergic child and olive oil for the soy-allergic child.
garlic clove, chopped	5.0	1.1%	5.0	1.0%	
mixed herbs, dried	2.0	0.4%	2.0	0.4%	
sesame seeds	48.0	10.1%	48.0	10.1%	
salt	0.0	0.0%	2.0	0.4%	Added to improve flavour.
Total	475.0	100.0%	477.0	100.0%	

Method:
Arrange the chicken thighs in a greased oven-proof dish.
Mix mayonnaise*, garlic, salt and dried herbs. Spread the mixture over the chicken thighs.
Sprinkle sesame seed over the chicken thighs and press down lightly.
Chill the chicken for 1 hour.
Bake at 180ºC for 15 to 20 min. Lower the temperature to 160ºC and bake for a further 30 to 35 min.
Grill the chicken turning once or twice for a few minutes until golden brown and crisp.

Rack of lamb with crust (Du Plessis, 2001:35). Serves 4-6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
rack of lamb, trimmed	460.0	76.7%	460.0	93.9%	
mustard, dry	5.0	0.8%	5.0	1.0%	
Crust:					
breadcrumbs, day old/oats toasted	80.0	13.3%	0.0	0.0%	If wheat-allergic child is also allergic to oats, omit it from recipe.
sun dried tomatoes, rehydrated, chopped	30.0	5.0%	0.0	0.0%	Omit from recipe, it's too expensive and not generally found in households.
oil	15.0	2.5%	15.0	3.1%	
herbs, freshly chopped	10.0	1.7%	10.0	2.0%	
Total	600.0	100.0%	490.0	100.0%	

Method:
Mix all the crust ingredients in a food processor for an even texture.
Clean the bones of the meat.
Seal the meat and cook to preferred degree of doneness at 180 °C.
Rub dry mustard to taste onto the meat and cover with the crust.
Reheat at 200°C until crust is crisp.

Spaghetti with Bolognaise sauce (The food allergy news cookbook, volume 1, 1999). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
spaghetti	200.0	19.9%	340.0	29.1%	Raw pasta absorbs 140 g water. Use suitable pasta for respective allergies.
mince	350.0	34.8%	350.0	30.0%	
tomato and onion mix	410.0	40.8%	410.0	35.1%	
tomato paste	30.0	3.0%	30.0	2.6%	
sugar	6.0	0.6%	20.0	1.7%	Increased to improve flavour.
salt	3.0	0.3%	7.0	0.6%	Increased to improve flavour.
pepper	3.0	0.3%	3.0	0.3%	
garlic	3.0	0.3%	7.0	0.6%	Increased to improve flavour.
Total	1005.0	100.0%	1167.0	100.0%	

Method:
Cook spaghetti until al dente (6-8 min).
In a large pot, mix tomato puree and tomato paste and a can of water from each can.
Add remaining ingredients. Bring to boil, reduce heat to medium and cover. Allow to simmer for 10 min, stirring occasionally.
Mix with cooked pasta.

Chicken stir-fry (Original). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
chicken strips, cooked	500.0	35.5%	500.0	36.4%	
onions, chopped	200.0	14.2%	200.0	14.5%	
red sweet peppers, diced	100.0	7.1%	100.0	7.3%	
mushrooms, sliced	100.0	7.1%	100.0	7.3%	
cabbage, chopped	100.0	7.1%	100.0	7.3%	
pineapple, diced	100.0	7.1%	100.0	7.3%	
patty pans, diced, precooked	100.0	7.1%	100.0	7.3%	
carrots, chopped	150.0	10.6%	150.0	10.9%	
soya sauce	25.0	1.8%	0.0	0.0%	Omitted for the soy and wheat-allergic child.
salt	5.0	0.4%	5.0	0.4%	
black pepper	5.0	0.4%	5.0	0.4%	
linseed oil	10.0	0.7%	0.0	0.0%	Omit from recipe, it's too expensive and not generally found in households.
oil	15.0	1.1%	15.0	1.1%	
Total	1410.0	100.0%	1375.0	100.0%	

Method:
Fry onions in oil until transparent.
Add the red pepper, carrots, cabbage and patty pans. Fry for 5 min, stirring regularly.
Add the remaining ingredients. Fry for a further 5 min, add rest of seasoning.
Serve hot.

Pan-fried fish with lemon sauce (*Reader's Digest*, 1990:199). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
sole, skinned	500.0	67.1%	500.0	75.2%	
rosemary, dried/dried herbs	2.0	0.3%	2.0	0.3%	
salt	2.0	0.3%	2.0	0.3%	
black pepper	1.0	0.1%	1.0	0.2%	
flour/potato flour	50.0	6.7%	50.0	7.5%	Added to replace flour for wheat-allergic child.
oil	160.0	21.5%	80.0	12.0%	
lemon juice	20.0	2.7%	20.0	3.0%	
parsley, chopped	10.0	1.3%	10.0	1.5%	
Total	745.0	100.0%	665.0	100.0%	

Method:
Sprinkle the fish inside with rosemary and outside with salt and pepper. Place the flour on a plate and coat the fish with the flour. Shake of the excess flour.
Heat the sunflower oil in a large frying-pan over moderate heat for about 1 min.
Place the fish in the oil, and cook for about 5 min on a side, until golden brown. Transfer the fish to a warm plate.
Discard the oil in the pan. Reduce the heat to low, add the, lemon juice and parsley. Cook about 30 seconds, scraping up any brown bits stuck to the pan.
Pour the sauce over the fish. Serves.

Crumbed lamb chops with herbs (Hall, 1991:97). Serves 6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
chops	1000.0	61.8%	1000.0	61.8%	
plain yoghurt/buttermilk	200.0	12.4%	200.0	12.4%	Omit for the child allergic to cow's milk.
thyme, dried/dried herbs	3.0	0.2%	3.0	0.2%	
marjoram, dried/dried herbs	5.0	0.3%	5.0	0.3%	
garlic salt	5.0	0.3%	5.0	0.3%	
mustard	5.0	0.3%	5.0	0.3%	
crumbs/oats, toasted	350.0	21.6%	350.0	21.6%	If wheat-allergic child is also allergic to oats, omit it from recipe.
oil	50.0	3.1%	50.0	3.1%	
Total	1618.0	96.9%	1618.0	96.9%	

Method:
Trim chops of excess fat. Mix remaining ingredients, except crumbs. Coat chops in crumbs/oats with yoghurt mixture, patting on firmly.
Chill for at least 2 hours to set coating.
To bake, preheat the oven to 160°C. Brush large shallow baking dish with oil and heat for 5 min in oven.
Turn chops once in hot oil, then cover and bake for 45 min. Uncover and bake for a further 30 min or until browned and tender. Serves.

Apricot chicken (*Woolworths*, 32). Serves 6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
chicken thight fillets	1500.0	72.3%	1500.0	73.7%	
oil	10.0	0.5%	10.0	0.5%	
apricots, dried	120.0	5.8%	80.0	3.9%	Decreased, product is very expensive.
apricot nectar	320.0	15.4%	320.0	15.7%	
chicken stock	100.0	4.8%	100.0	4.9%	
dried herbs	10.0	0.5%	10.0	0.5%	
black pepper	5.0	0.2%	5.0	0.2%	
salt	5.0	0.2%	5.0	0.2%	
parsley, chopped	5.0	0.2%	5.0	0.2%	
Total	2075.0	100.0%	2035.0	100.0%	

Method:
Trim the chicken of excess fat and sinew.
Cut chicken into 3 cm cubes. Heat oil in a large pan. Cook chicken in batches over medium-high heat until browned. Remove from heat and drain on paper towel.
Slice dried apricots into strips. Return chicken to pan with apricots, apricot nectar, stock and soup mix, season to taste, mix well.
Bring to boil. Lower the heat and simmer, covered, for 20 min, stirring occasionally until chicken is tender and cooked through and sauce is slightly thickened.
Remove pan from heat. Stir in parsley.

Bacon and mushroom pasta (Original). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
macaroni pasta, raw	250.0	24.9%	360.0	32.3%	Raw pasta absorbs 110 g water. Use a pasta free from the specific allergen.
bacon	200.0	19.9%	200.0	17.9%	
mushroom	200.0	19.9%	200.0	17.9%	
onion	100.0	9.9%	100.0	9.0%	
cream/soy milk	250.0	24.9%	250.0	22.4%	Replace cream with soy milk for milk-allergic child.
mixed spices	6.0	0.6%	6.0	0.5%	
Total	1006.0	100.0%	1116.0	100.0%	

Method:
Cook macaroni al dente.
Stir-fry the bacon and onion, until the onion becomes transparent. Add the mushrooms and fry for another 3 min. Put aside.
Prepare a white sauce with the other ingredients. Add onion mixture. Mix with macaroni and serve hot.

ADDENDUM 10B: RECIPES FOR THE MAIN LUNCH DISHES OF TWO-WEEK MENU CYCLES FOR THE FOUR RESPECTIVE HOUSEHOLDS.

"Melkkos" with tapioca (Lategan, 1997: 25). Serves 3.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
tapioca, raw	45.0	6.6%	45.0	6.7%	
boiling water	100.0	14.7%	100.0	14.9%	
milk/soy milk	500.0	73.7%	500.0	74.6%	Replace milk with soy milk for the cow's milk-allergic child.
cinnamon stick	10.0	1.5%	2.0	0.3%	
sugar	10.0	1.5%	10.0	1.5%	
salt	2.0	0.3%	2.0	0.3%	
vanilla essence	2.0	0.3%	2.0	0.3%	
oil	9.3	1.4%	9.3	1.4%	
Total	678.3	100.0%	670.3	100.0%	

Method:
Soak tapioca for 15 min in boiling water.
Bring milk and cinnamon stick to a boil and stir soaked tapioca into mixture. Bring mixture to a boil again. Stir and cook for 5 min until mixture thickens.
Stir sugar, salt, essence and oil into cooked mixture. Serve "melkkos" hot with cinnamon sugar.

Warm spiced chickpea dish (Hall, 1991:122). Serves 8.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oil	44.0	2.8%	44.0	2.8%	
onions, chopped	200.0	12.6%	200.0	12.7%	
garlic cloves, chopped	10.0	0.6%	10.0	0.6%	
cumin, ground	5.0	0.3%	0.0	0.0%	Omit from recipe, too many ingredients and not commonly found in households.
turmeric	5.0	0.3%	0.0	0.0%	Omit from recipe, too many ingredients and not commonly found in households.
cinnamon, ground	5.0	0.3%	5.0	0.3%	
ginger, ground/dried herbs	5.0	0.3%	5.0	0.3%	
coriander, ground/dried herbs	5.0	0.3%	5.0	0.3%	
table celery sticks, chopped	35.0	2.2%	35.0	2.2%	
green pepper, seeded and diced	75.0	4.7%	75.0	4.8%	
chickpeas cooked, drained	500.0	31.6%	500.0	31.8%	
parsley, chopped	30.0	1.9%	30.0	1.9%	
tomatoes and juice (tinned)	410.0	25.9%	410.0	26.1%	
bay leaves	1.0	0.1%	0.0	0.0%	Omit from recipe, too many ingredients and not generally found in households.
water/vegetable stock	250.0	15.8%	250.0	15.9%	
salt	2.0	0.1%	2.0	0.1%	
sugar	2.0	0.1%	2.0	0.1%	
Total	1584.0	100.0%	1573.0	100.0%	

Method:
Heat oil in a large saucepan. Add onions, garlic, spices, celery and pepper.
Cover and cook over very low heat until onions are soft. Add remaining ingredients, bring to the boil, then cover and simmer on low heat for about 30 min, stirring occasionally. Add water if necessary for a good gravy.
Check seasoning and serve.

Mushroom and garlic potato dish (Original). Serves 4-6.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
potatoes, cooked and sliced	540.0	42.7%	540.0	42.7%	
onion, big, chopped	100.0	7.9%	100.0	7.9%	
mushrooms, sliced	250.0	19.8%	250.0	19.8%	
garlic cloves, crushed	15.0	1.2%	15.0	1.2%	
cake flour/potato flour	50.0	4.0%	50.0	4.0%	The wheat-allergic child must use potato flour.
oil	50.0	4.0%	50.0	4.0%	
milk/soy milk	150.0	0.0%	150.0	11.9%	Soy milk is use as the replacement of cow's milk for the milk-allergic child.
cheese, grated	100.0	7.9%	0.0	0.0%	Omit for milk-allergic child.
goat's cheese	0.0	0.0%	100.0	7.9%	Goat's cheese can replacement cheese for the milk-allergic child, if there is no reaction to it.
salt	5.0	0.4%	5.0	0.4%	
seasoning salt	5.0	0.4%	5.0	0.4%	
Total	1265.0	88.1%	1265.0	100.0%	

Method:
Fry chopped onions until transparent, then add mushrooms. Fry and remove from heat.
Melt the oil over low heat and add the cake/potato flour. Fry for 1 minute.
Add the milk/soy milk while stirring. Keep it over heat until thickened and cooked.
Add the garlic, salt and seasoning to onion mix. Reheat.
Add to onion mix white sauce and pour over potatoes.
Garnish with the grated cheese or for the milk-allergic child with grated potato, mayonnaise and parsley.

Spinach and mango salad (Lategan, 2000:114). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
spinach leaves, fresh	75.0	12.5%	75.0	8.9%	
mango	375.0	62.4%	375.0	44.6%	
mint, chopped	8.0	1.3%	8.0	1.0%	
yoghurt, fat free plain/soy	75.0	12.5%	0.0	0.0%	Omit from recipe for cow's milk-allergic child.
honey	15.0	2.5%	15.0	1.8%	
orange juice	45.0	7.5%	45.0	5.4%	
lemon juice	8.0	1.3%	8.0	1.0%	
egg	0.0	0.0%	240.0	28.5%	Protein is added to dish, not suitable for egg-allergic child.
raisins	0.0	0.0%	75.0	8.9%	Add colour and taste, is a functional food, is high in iron.
Total	601.0	100.0%	841.0	100.0%	

Method:
Shred spinach into thin strips.
Cut mango into cubes or strips. Add mango and mint to spinach.
Mix rest of ingredients. Pour salad dressing over salad. Chill and serve within 3 hours.
Garnished with peeled, boiled egg halves and raisins.

Pizza bread with sauce (The food allergy news cookbook, volume 2, 1999). Serves 4-6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
flour/potato flour	240.0	26.3%	240.0	25.0%	Use potato flour for the wheat-allergic child.
baking powder	4.0	0.4%	4.0	0.4%	
salt	3.0	0.3%	3.0	0.3%	
oregano	5.0	0.5%	5.0	0.5%	
oil	70.0	7.7%	70.0	7.3%	
water	200.0	22.0%	200.0	20.8%	
sugar	10.0	1.1%	10.0	1.0%	
Topping:					
tomato paste	170.0	18.7%	170.0	17.7%	
basil	3.0	0.3%	3.0	0.3%	
oregano	3.0	0.3%	3.0	0.3%	
garlic powder	3.0	0.3%	3.0	0.3%	
pineapple	0.0	0.0%	150.0	15.6%	Added to recipe to improve taste and colour.
ham	0.0	0.0%	100.0	10.4%	Added to recipe to improve taste and colour.
cheese/goat's cheese	200.0	22.0%	0.0	0.0%	Goat's cheese replace cheddar cheese for cow's milk-allergic child, child can consume it.
Total	911.0	100.0%	961.0	100.0%	

Method:
Preheat the oven to 200 °C. Grease 20 cm x 20 cm baking pan. Set aside.
In a large bowl, stir together flour/potato flour, baking powder, salt and oregano. Set aside.
In medium bowl, mix water, oil, sugar and baking powder. Add this mixture to the dry ingredients. Stir until just blended. Spread batter into prepared pan.
Combine the rest of the ingredients for pizza sauce. Spread over batter.
Bake 30 min or until done. Cut into squares and serve.

Wheat-free pizza dough (The food allergy news cookbook, volume 2, 1999).

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oats	360.0	58.1%	360.0	58.0%	
sugar	7.0	1.1%	7.0	1.1%	
salt	3.0	0.5%	4.0	0.6%	Increased to improve flavour.
boiling water	250.0	40.3%	250.0	40.3%	
Total	620.0	100.0%	621.0	100.0%	

Method:
Preheat oven to 200 °C. Grease a 25 cm pizza pan.
Grind oats 20 seconds in food processor. Put oats, sugar and salt in bowl. Add boiling water and mix vigorously. Form into a ball, and let cool for 1 minute.
Press down into pizza pan and roll out to cover bottom of pan.
Pick the crust with a fork.
Bake 5 min.
Add toppings (see sauce from above).

Couscous vegetable salad. Serve 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
couscous, raw	250.0	29.6%	325.0	35.3%	Raw couscous absorbs 75 g water.
oil	25.0	3.0%	25.0	2.7%	
green pepper, unseeded, chopped	60.0	7.1%	60.0	6.5%	
onion, chopped	100.0	11.8%	100.0	10.9%	
Ratatouille can	410.0	48.5%	410.0	44.6%	
Total	845.0	100.0%	920.0	100.0%	

Method:
Cook the couscous.
In a large frying pan, fry the onions and green pepper in the oil, until the onions changes to a white colour.
Warm the can ratatoille.
In a large plate put the couscous under, then the ratatoille and then the stir-fried vegetables on top.
Serve warm.

Butternut soup (Lategan, 2000:17). Serves 5.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
butternut, peeled	500.0	49.1%	500.0	39.5%	
water	250.0	24.6%	250.0	19.8%	
vegetable extract powder	10.0	1.0%	0.0	0.0%	Omit because of possible HVP and not readily found in houses.
chicken stock	0.0	0.0%	7.0	0.6%	More generally found in households, than vegetable extract powder.
milk/soy milk	250.0	24.6%	250.0	19.8%	Soy milk added to replace cow's milk.
nutmeg	2.0	0.2%	2.0	0.2%	
ginger, grounded	2.0	0.2%	2.0	0.2%	
cinnamon, grounded	2.0	0.2%	2.0	0.2%	
salt	2.0	0.2%	2.0	0.2%	
orange juice	0.0	0.0%	250.0	19.8%	
Total	1018.0	100.0%	1265.0	100.0%	

Method:
Cut butternut into cubes. Boil with 250 ml water and chicken stock powder until cooked and soft (15 to 20 min).
Drain the vegetable water and top up with boiling water to 500 ml.
Process the cooked butternut, water and milk/soy milk in a food processor until smooth. Add orange juice, until it has the right texture.
Season with nutmeg, ginger, cinnamon and salt.
Reheat to boiling point.
Serve hot.

Pasta salad (Reader's Digest, 1990:268). Serves 5.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
spaghetti, raw	500.0	42.6%	810.0	55.7%	Raw pasta absorb 310 g water. Use a brand name suitable for the specific allergy.
oil	60.0	5.1%	30.0	2.1%	Lower the fat content.
garlic, cloves, chopped	10.0	0.9%	10.0	0.7%	
tomatoes, chopped	400.0	34.1%	400.0	27.5%	
tuna , drained	200.0	17.0%	200.0	13.8%	
black pepper	2.0	0.2%	2.0	0.1%	
parsley, chopped	2.0	0.2%	2.0	0.1%	
Total	1174.0	100.0%	1454.0	100.0%	

Method:
Cook the spaghetti al dente. Meanwhile, melt 30 g of oil in a large frying pan over low heat.
Add the garlic, and cook, uncovered for 3 min, or until golden. Add the tomatoes, and cook, uncovered, for 10 min, stirring occasionally.
Add the tuna pieces to the pan, stir to mix and cook for 5 min, uncovered, over moderate heat.
Remove from heat, and stir in the pepper, parsley and the remaining 30 g of oil.
Drain the spaghetti thoroughly in a colander, and toss with sauce in the pan. Serves.

Baked asparagus dish (Lategan, 2000:39). Serves 6-8.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
whole-wheat flour/potato flour	65.0	6.6%	80.0	9.6%	Wheat-allergic child must replace whole-wheat and cake flour with potato and rye flour.
cake flour/rye flour	60.0	6.1%	45.0	5.4%	Wheat-allergic child must replace whole-wheat and cake flour with potato and rye flour.
baking powder	6.0	0.6%	6.0	0.7%	
salt	2.0	0.2%	2.0	0.2%	
white pepper	2.0	0.2%	2.0	0.2%	
mustard powder	2.0	0.2%	2.0	0.2%	
cheddar cheese, grated	50.0	5.1%	0.0	0.0%	Omit in the case of cow's milk-allergic child.
oil	45.0	4.6%	45.0	5.4%	
egg	100.0	10.1%	100.0	11.9%	
drained asparagus liquid	125.0	12.7%	125.0	14.9%	
Filling:					
onion, grated	25.0	2.5%	25.0	3.0%	
asparagus cuts	175.0	17.7%	175.0	20.9%	
cheddar/goat's cheese, grated	100.0	10.1%	0.0	0.0%	Omit in the case of cow's milk-allergic child or replace by goat's cheese, if child can tolerate it.
parsley, dried	5.0	0.5%	5.0	0.6%	
eggs, beaten	100.0	10.1%	100.0	11.9%	
milk/soy milk	125.0	12.7%	125.0	14.9%	Cow's milk-allergic child must replace milk with soya milk.
Total	987.0	100.0%	837.0	100.0%	

Method:
Base: Place the whole-wheat flour into the mixing bowl. Sift the cake flour, baking powder, salt, pepper and mustard powder together. Add to the whole-wheat flour[4].
Stir to mix.
Beat the eggs and asparagus liquid into the dry ingredients. Stir to produce a soft dough.
Spoon the dough into a 250 x 250 mm greased oven dish. Level the dough.
Topping: Scatter the onion, asparagus cuts, cheese and parsley over the base.
Beat the eggs and milk to mix. Carefully pour the mixture over the topping.
Replacements for **egg-allergic child**:
Replace 200g egg with 70g smooth cottage cheese, 130 mg white, adding the remaining milk (see above) to the sauce.
Bake at 180°C for 35 - 40 min until the dish is golden brown and the egg layer has set. Serve hot.

Cannelloni (Lategan, 2000:46). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oil	5.0	0.5%	5.0	0.6%	
onion, chopped	100.0	9.3%	100.0	12.5%	
garlic cloves, chopped	20.0	1.9%	20.0	2.5%	
tin peeled whole tomatoes	425.0	39.4%	425.0	53.1%	
salt	3.0	0.3%	3.0	0.4%	
black pepper	3.0	0.3%	3.0	0.4%	
dried basil/dried herbs	5.0	0.5%	5.0	0.6%	
dried origanum/dried herbs	3.0	0.3%	3.0	0.4%	
cannelloni tubes, raw	80.0	7.4%	80.0	10.0%	Wheat-free in the case of the wheat-allergic child. Cannelloni tubes absorbs sauce.
fresh spinach	150.0	13.9%	150.0	18.8%	
smooth ricotta/goat's cheese	250.0	23.1%	0.0	0.0%	See Replacements
pepper	3.0	0.3%	3.0	0.4%	
nutmeg	3.0	0.3%	3.0	0.4%	
Parmesan cheese, grated	30.0	2.8%	0.0	0.0%	Omit in the case of the cow's milk-allergic child.
Total	1080.0	100.0%	800.0	100.0%	

Method:
Prepare the tomato sauce by heating the oil. Add onion and garlic. Stir-fry until onion is translucent. Add chopped tomatoes and tomato juice.
Simmer for 2 to 3 min. Add seasoning. Simmer for 10 to 12 min, until sauce thickens.
Steam the spinach for 5 to 8 min until the leaves are wilted. Drain, spin and cool.
Mix spinach and ricotta cheese, and season with salt, pepper and nutmeg to taste.
Fill raw cannelloni tubes with the spinach mixture. Arrange filled tubes in a greased shallow ovenproof dish.
Pour the tomato sauce over the cannelloni. Sprinkle with parmesan cheese*.
Bake at 180°C for 20 to 30 min until browned and bubbling hot. Serves hot.
Replacement for **milk-allergic** child:
Replace ricotta cheese with soy milk white sauce. 25 g oil, 25 g cake flour and 200 g soy milk.

Broccoli chowder (Reader's Digest, 1990:40). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
broccoli	500.0	27.3%	500.0	20.8%	
chicken stock	420.0	22.9%	420.0	17.5%	
milk/soy milk	500.0	27.3%	500.0	20.8%	Added to replace milk and cream for cow's milk-allergic child.
soya milk	0.0	0.0%	600.0	25.0%	
ham, cooked, diced	250.0	13.7%	250.0	10.4%	
salt	3.0	0.2%	3.0	0.1%	
black pepper	3.0	0.2%	3.0	0.1%	
cream/milk/soy milk	125.0	6.8%	125.0	5.2%	Added to replace milk and cream for cow's milk-allergic child.
cheddar cheese	30.0	1.6%	0.0	0.0%	Omit for cow's-mlk allergic child.
Total	1831.0	100.0%	2401.0	100.0%	

Method:
Trim the leaves and coarse stems from the broccoli, and cut the stems and florets into bite-size pieces.
Bring the chicken stock to a boil in a large saucepan.
Add the broccoli and cook, uncovered, for 5 min, or until the broccoli is crisp-tender.
Using a slotted spoon, remove the broccoli from the saucepan, chop coarsely and put aside.
Add the milk/soy milk, ham, salt if necessary, and pepper to the stock, bring to boil, then stir in the cream/soy milk and the broccoli.
Heat until the soup returns to a simmer. Top each serving with a tablespoon of the cheese, if permitted.

Fried potato fritters (Lategan, 1997: 58). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
potato, cooked	350.0	71.2%	350.0	74.7%	
eggs, separated	100.0	20.3%	100.0	21.3%	
cheddar cheese, grated	25.0	5.1%	0.0	0.0%	Omit in case of milk-allegic child.
parsley, chopped	12.5	2.5%	12.5	2.7%	
salt	2.0	0.4%	4.0	0.9%	Increased, to improve flavour.
black pepper	2.0	0.4%	2.0	0.4%	
Total	491.5	100.0%	468.5	100.0%	

Method:
Mix the mashed potato, egg yolk, cheese, parsley, salt and pepper.
Whip egg whites until stiff. Fold into the potato mixture.
Drop spoonfuls of the mixture into a greased, preheated frying pan. Fry fritters on both sides until golden brown and set.

Pancakes without eggs (Lategan, 1997: 59). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
cake flour/buckwheat	120.0	18.8%	120.0	18.5%	
baking powder	2.0	0.3%	2.0	0.3%	
bicarbonate of soda	2.0	0.3%	2.0	0.3%	
salt	1.0	0.2%	1.0	0.2%	
water	450.0	70.3%	470.0	72.3%	Increased, to compensate for the decrease in oil.
vinegar	10.0	1.6%	10.0	1.5%	
oil	55.0	8.6%	45.0	6.9%	Decreaseed, to lower the fat content of the recipe.
Total	640.0	100.0%	650.0	100.0%	

Method:
Sift together cake/buckwheat flour, baking powder, bicarbonate of soda and salt.
Mix water, vinegar and oil. Stir half the liquid into the dry ingredients. Mix until smooth. Stir in the rest of the liquid to produce a smooth butter or liquid consistency.
Pour 100 ml batter at a time into a preheated, greased frying pan.
Cook pancakes until golden brown and done. Serve with filling (see below).

Recipe: Pancake filling. Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
bacon	300.0	23.6%	300.0	23.6%	
onion	100.0	7.9%	100.0	7.9%	
mushroom	200.0	15.7%	200.0	15.7%	
garlic	10.0	0.8%	10.0	0.8%	
cake flour/potato flour	75.0	5.9%	75.0	5.9%	Potato flour added to replace flour for wheat-allergic child.
oil	75.0	5.9%	75.0	5.9%	
milk/soy milk	500.0	39.4%	500.0	39.4%	Added to replace milk for cow's milk-allergic child.
salt	5.0	0.4%	5.0	0.4%	
black pepper	5.0	0.4%	5.0	0.4%	
Total	1270.0	100.0%	1270.0	100.0%	

Method:
Fry the onions and bacon in a frying pan over moderate heat, until the onions turn transparent.
Add the mushrooms and garlic and keep over heat for a further 3 min.
Prepare a white sauce from the remaining ingredients and add to the onion mixture.
Fill pancakes with filling. Serves.

Spinach quiche (Lategan, 2000:70)/ Spinach pie (see Section 5.2.2.2). Serves 6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
Base:					
self-raising flour	250.0	29.8%	250.0	33.8%	See Replacements
salt	1.0	0.1%	1.0	0.1%	
sugar	10.0	1.2%	10.0	1.4%	
oil	100.0	11.9%	100.0	13.5%	
hot water	75.0	8.9%	75.0	10.1%	
Filling:					
spinach, chopped	300.0	35.8%	300.0	40.6%	
onion, chopped	75.0	8.9%	75.0	10.1%	
garlic	10.0	1.2%	10.0	1.4%	
salt	1.0	0.1%	1.0	0.1%	
feta cheese, crumbled	100.0	11.9%	0.0	0.0%	See Replacements
nutmeg	1.0	0.1%	1.0	0.1%	
black pepper	1.0	0.1%	1.0	0.1%	
eggs	100.0	11.9%	100.0	13.5%	See Replacements
yoghurt, low-fat, plain/soy milk	250.0	29.8%	250.0	33.8%	
paprika	1.0	0.1%	1.0	0.1%	
Total	839.0	100.0%	739.0	100.0%	

Method:
Base: Sift flour*, salt and sugar together.
Rub oil into dry ingredients.
Gradually add the hot water to the flour mixture. Mix to a soft non-sticky dough which will roll easily. Cover the dough and refrigerate while preparing the filling.
Filling: Steam the spinach, onion, garlic and salt for 6 to 8 min at a low temperature until done. Drain spinach in icy water, spin dry and allow to cool.
Roll out the dough thinly and place into a 250 mm pie dish. Trim the edges. Cut shapes or strips from the remaining dough. Keep as a garnish.
Spread the cooked spinach onto the base. Crumble the feta cheese evenly over the spinach. Sprinkle with nutmeg, salt and black pepper.
Beat the eggs, salt, pepper, paprika and yoghurt/soy milk until mixed. Carefully pour the mixture over the spinach layer. Decorate with dough strips.
Bake at 180°C for 30 to 35 min. Serves hot.
Replacement: for wheat-allergic child:
Replace the quiche base with a piquant potato topping:
250 g cooked, mashed potatoes, 5 g salt, 0,3g pepper, 10 g mustard and 50 g milk. Mix all the ingredients together.
Replacement: for milk-allergic child:
Replace feta with 100 g cooked rice and 100 g ratatouille.
Replacement: for egg-allergic child:
Replace 200g egg with 70g smooth cottage cheese, 130 mg white, adding the remaining milk (see above) to the sauce.
Pour over meat base in casserole, etc.

Omelette with tomato and cheese (Lategan, 2000:30) (see Section 5.2.2.2). Serves 1.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oil	5.0	2.4%	5.0	2.5%	
onion, chopped	25.0	12.0%	25.0	12.6%	
tomato, chopped	50.0	23.9%	50.0	25.1%	
garlic, chopped	5.0	2.4%	5.0	2.5%	
salt	2.0	1.0%	2.0	1.0%	
black pepper	2.0	1.0%	2.0	1.0%	
olive oil	5.0	2.4%	5.0	2.5%	
eggs, beaten	100.0	47.8%	100.0	50.3%	Eggs not replaced - recipe not suitable for egg-allergic child.
cheddar cheese, grated	10.0	4.8%	0.0	0.0%	Omitted for the cow's milk-allergic child.
parsley, chopped	5.0	2.4%	5.0	2.5%	
Total	209.0	100.0%	199.0	100.0%	

Method:
Heat oil. Add onion and stir-fry until the onion is translucent.
Add tomato and garlic to the fried onion. Reduce heat. Cover and simmer for 10 to 15 min until tomato is cooked and reduced.
Season with salt and pepper.
Heat 5 ml oil over medium heat in a frying pan. Pour beaten egg into the frying pan. Cook the egg over medium heat until set.
Spoon the tomato mixture over half the omelette. Turn the other half over, covering the tomato mixture. Transfer the filled omelette to a plate.
Sprinkle grated cheese (omit for milk-allergic child) and chopped parsley over the omelette.
Serve immediately.

ADDENDUM 10C: RECIPES FOR THE MAIN BREAKFAST DISHES OF THE TWO-WEEK MENU CYCLES FOR THE FOUR RESPECTIVE HOUSEHOLDS.

Fruit salad (Original). Serves 4

Ingredients	Recipe	
	g	%
banana	150.0	15.0%
guava	250.0	25.0%
apple	150.0	15.0%
paw-paw	300.0	30.0%
pear	100.0	10.0%
kiwi	50.0	5.0%
Total	1000.0	100.0%

Method:
Slice all the fruit in suitable sizes and mix in a glass bowl.

Boiled egg (Original) (see Section 5.2.2.2). Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
egg	360.0	39.6%	0.0	0.0%	Recipe not suitable for egg-allergic child.
tomato	400.0	44.0%	400.0	63.5%	
cheese	150.0	16.5%	150.0	23.8%	Omit in the case of the cow's milk-allergic child.
ham	0.0	0.0%	80.0	12.7%	
Total	910.0	100.0%	630.0	100.0%	

Method:
Boil the egg until done to preference, and serve with tomato, cheese and ham.

Apple and carrot muffins (Lategan, 1997:41). Serves 12.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
maize meal, sifted	120.0	18.4%	120.0	18.4%	
baking powder	2.5	0.4%	2.5	0.4%	
cinnamon	2.0	0.3%	2.0	0.3%	
salt	2.0	0.3%	2.0	0.3%	
sugar	40.0	6.1%	40.0	6.1%	
oil	85.0	13.0%	85.0	13.0%	
eggs	100.0	15.3%	100.0	15.3%	Egg-allergic child use other recipe. Do not omit egg in other cases, as it gives structure.
carrots, grated	100.0	15.3%	100.0	15.3%	
apple, grated	200.0	30.7%	200.0	30.7%	
Total	651.5	100.0%	651.5	100.0%	

Method:
Sift together maize meal, baking powder, cinnamon, salt and sugar.
Beat together oil and eggs.
Stir egg mixture, carrots and apple puree into dry ingredients. Mix thoroughly.
Spoon the batter into greased muffin pans until two-thirds full. Bake at 180°C for 25 to 30 min.

Potato muffins (Lategan, 1997:48). Serves 12.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
potatoes	1000.0	82.6%	1000.0	82.6%	
onion	50.0	4.1%	50.0	4.1%	
eggs, beaten	100.0	8.3%	100.0	8.3%	Not suitable egg-allergic child.
potato flour	25.0	2.1%	25.0	2.1%	
salt	3.0	0.2%	3.0	0.2%	
white pepper	2.0	0.2%	2.0	0.2%	
baking powder	5.0	0.4%	5.0	0.4%	
oil	25.0	2.1%	25.0	2.1%	
Total	1210.0	100.0%	1210.0	100.0%	

Method:
Peel and grate the potatoes. Place in a colander to drain excess potato water.
Place in a mixing bowl.
Grate onion. Add to potato.
Add eggs, potato flour, salt, pepper and baking powder to potato and onion. Mix well.
Preheat muffin pan in oven at 180°C for 5 min.
Pour oil into the 12 hollows of the muffin pan.
Spoon potato mixture into muffin pan to fill approximately two-thirds.
Bake at 180°C for 40 to 45 min until golden brown and done.
Serve immediately.

Oats porridge with milk and honey (Original). Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
oats, raw	100.0	12.7%	100.0	12.7%	
water	325.0	41.4%	325.0	41.4%	All the water is absorb in the porridge.
milk/soy milk	325.0	41.4%	325.0	41.4%	Soy milk added to replace cow's milk for milk-allergic child.
honey	30.0	3.8%	30.0	3.8%	
salt	5.0	0.6%	5.0	0.6%	
Total	785.0	100.0%	785.0	100.0%	

Method:
Place the oats, with salt, in a pot. Add water and milk and place on a hot plate.
Stir continuously, until it boils, lower the heat and simmer for 3 min.
Add the honey when porridge is already in bowls.

Sorghum (*Maltabella*) porridge with milk and sugar. Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
Maltabella	100.0	13.0%	100.0	13.0%	
water	325.0	42.4%	325.0	42.4%	
milk/soy milk	325.0	42.4%	325.0	42.4%	Soy milk added to replace cow's milk for milk-allergic child.
sugar	15.0	2.0%	15.0	2.0%	
salt	2.0	0.3%	2.0	0.3%	
Total	767.0	100.0%	767.0	100.0%	

Method:
Boil 500g of water on the stove. Add the salt.
Mix the flour, sugar and salt with 100 ml water. Add the paste to the boiling water and milk mixture. Blend well.
Return to heat. Stir over dubble boiler to cook further for 10 -15 min.
Add more water if necessary.

Wheat-free muesli (Pienaar, 2002). Serves 2.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
almonds	60.0	12.0%	60.0	12.0%	
buckwheat	60.0	12.0%	60.0	12.0%	
desiccated coconut	20.0	4.0%	20.0	4.0%	
corn flakes	55.0	11.0%	55.0	11.0%	
currants	45.0	9.0%	0.0	0.0%	Omit from recipe, it's to expensive and not generally found in households.
dried apricots	45.0	9.0%	45.0	9.0%	
honey	60.0	12.0%	60.0	12.0%	
raisins	45.0	9.0%	45.0	9.0%	
rice crisps	50.0	10.0%	50.0	10.0%	
sesame seeds	20.0	4.0%	0.0	0.0%	Omit from recipe, it's to expensive and not generally found in households.
sunflower seeds	30.0	6.0%	30.0	6.0%	
Total	500.0	100.0%	500.0	100.0%	

Method:
Preheat oven to 170°C.
Combine the seeds, cornflakes, puffed rice and buckwheat flakes in a bowl. Place in a large baking tray and bake for 10 min. Add the nuts.
Heat the honey until thin and pour over mixture. Stir to coat.
Bake for another 15 min, until mixture becomes a good golden brown colour.
Take out of the oven and stir.
Reduce oven temperature to 100°C. Place the mixture back in the oven and allowed to dry out for 45 min, leaving the oven door slightly open.
Stir in raisins and dried apricots and leave to cool.
Serves with yoghurt/milk/soy milk.

Mealie meal with milk and honey (Original). Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
mealie meal	200.0	23.4%	200.0	22.6%	
water	325.0	38.0%	325.0	36.7%	
milk/soy milk	325.0	0.0%	325.0	36.7%	Soy milk added to replace cow's milk for milk-allergic child.
honey	0.0	0.0%	30.0	3.4%	
salt	5.0	0.6%	5.0	0.6%	
Total	855.0	62.0%	885.0	100.0%	

Method:
Boil 500 ml of water and milk/soy milk on the stove. Add the salt.
Mix the flour with 250 ml water. Add the pasta to the boiling water.
Mix until it thickens. Occasionally stir while cooking. Cook slowly until done.
Add more water if necessary.

Toasted sandwich (Original). Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
bread	120.0	29.9%	120.0	39.7%	
oil	30.0	7.5%	30.0	9.9%	
tomato	100.0	24.9%	100.0	33.1%	
ham	50.0	12.4%	50.0	16.6%	
cheese/goat's cheese	100.0	24.9%	0.0	0.0%	If child is allergic to cow's milk, replace cheese with goat's milk, if it is tolerated.
salt	1.0	0.2%	1.0	0.3%	
pepper	1.0	0.2%	1.0	0.3%	
Total	402.0	100.0%	302.0	100.0%	

Method:
Slice bread and brush with oil.
Place the ham, then the tomato on top of the bread. Season bread.
Sprinkle cheese on top.
Grill under element until cheese melts.

Whole-wheat bread (Lategan, 1997: 44).

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
whole-wheat flour	520.0	34.4%	520.0	35.6%	Recipe not suitable for wheat-allergic child.
cake flour	240.0	15.9%	240.0	16.4%	Recipe not suitable for wheat-allergic child.
sunflower seeds	42.0	2.8%	42.0	2.9%	
linseed	48.0	3.2%	0.0	0.0%	Omit because it is to expensive and not generally found in households.
packet instant yeast	7.0	0.5%	7.0	0.5%	
salt	2.0	0.1%	2.0	0.1%	
vinegar	25.0	1.7%	25.0	1.7%	
oil	26.0	1.7%	26.0	1.8%	
lukewarm water	600.0	39.7%	600.0	41.0%	
Total	1510.0	100.0%	1462.0	100.0%	

Method:
Mix dry ingredients in a large mixing bowl.
Add vinegar, oil and 600 ml water to the dry ingredients and mix to form a soft slightly sticky dough (add more water if needed). Knead well.
Place dough into a medium-sized greased loaf pan to fill it halfway. Smooth dough surface. Put loaf pan into a cooking bag and tie.
Wrap in a clean tea towel. Leave at 80°C for 25 min or until double in size.
Remove loaf pan from oven and keep covered while increasing oven temperature at 180°C.
Bake at 180°C for 60 min. When done, the loaf will sound hollow when tapped. Allow to cool.

Rice bread (Lategan, 1997: 44).

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
rice flour	125.0	22.7%	125.0	22.6%	
soya flour	85.0	15.5%	85.0	15.3%	Recipe not suitable for soy-allergic child.
maize flour, sifted	65.0	11.8%	65.0	11.7%	
salt	3.0	0.5%	4.0	0.7%	Increased to improve flavour.
sugar	8.0	1.5%	10.0	1.8%	Increased to improve flavour.
baking powder	6.0	1.1%	7.0	1.3%	Increased to improve texture.
oil	8.0	1.5%	8.0	1.4%	
water	250.0	45.5%	250.0	45.1%	
Total	550.0	100.0%	554.0	100.0%	

Method:
Sift together flour, salt, sugar and baking powder.
Add oil and water to the dry ingredients. Mix to produce a soft dough.
Add more water if necessary.
Spoon the dough into a small greased bread tin. Smooth.
Bake at 180°C for 40 to 45 min until golden brown and done. The bread is best when served lukewarm and freshly baked.

ADDENDUM 10D: OTHER RECIPES FOR THE TWO-WEEK MENU CYCLES OF THE FOUR RESPECTIVE ALLERGIES.

Tagliatelle pasta tossed in olive oil (Original). Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
Tagliatelle pasta, raw	80.0	78.4%	145.0	86.8%	Raw pasta absorbs 65 g water. Use a suitable pasta for respective allergies.
oil	22.0	21.6%	22.0	13.2%	
Total	102.0	100.0%	167.0	100.0%	

Method:
Cooked pasta, until soft.
Sprinkle olive oil over and stir. Serves.

Mixed vegetables (Lategan, 2000:107). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
small brinjals, sliced	250.0	41.6%	250.0	20.7%	
red sweet pepper, seeded, chopped	150.0	25.0%	150.0	12.4%	
green sweet pepper, seeded, chopped	150.0	25.0%	150.0	12.4%	
oil	45.0	7.5%	45.0	3.7%	
salt	3.0	0.5%	3.0	0.2%	
pepper	3.0	0.5%	3.0	0.2%	
mixed spices	0.0	0.0%	5.0	0.4%	Add some flavour to improve taste, and is a functional food.
carrots, chopped	0.0	0.0%	200.0	16.6%	Add some flavour to improve taste, add colour and is a functional food.
mushrooms, sliced	0.0	0.0%	200.0	16.6%	Add some flavour to improve taste, add colour and is a functional food.
beans	0.0	0.0%	200.0	16.6%	Add some flavour to improve taste, add colour and is a functional food.
Total	601.0	100.0%	1206.0	100.0%	

Method:
Soak the brinjal slices for 30 min in salt water. Rinse in fresh water. Drain.
Cut the peppers, carrots, mushrooms and beans in pieces.
Line a swiss roll baking tray with foil, shiny side up. Grease lightly with oil.
Arrange the vegetables in a single layer on the tray. Brush slightly with oil.
Carefully grill the vegetables under the preheated grill of the oven. Turn vegetables with an egg lifter when they turn colour.
Brush the other side of the vegetables with oil. Grill the vegetables until the brinjals are a golden colour and cooked.
Serve hot. Season slightly with salt and pepper.

Green salad (Original). Serves 4.

Ingredients		Recipe
	g	%
lettuce	30.0	12.5%
cucumber	100.0	41.7%
apple	60.0	25.0%
walnuts	50.0	20.8%
Total	240.0	100.0%

Method:
Wash and dry the lettuce and break into pieces.
Cut cucumber in rings and apple in wedges. Mix all in a glass bowl.
Sprinkle walnuts on top of salad.

Brown rice (Original). Serves 4-6.

Ingredients		Recipe		Adapted recipe	Reason for change/ingredient
	g	%	g	%	
brown rice, raw	100.0	95.2%	300.0	98.4%	Raw rice absorbs 200 g water.
salt	5.0	4.8%	5.0	1.6%	
Total	105.0	100.0%	305.0	100.0%	

Method:
Bring 500 ml water to the boil.
Add the rice and salt to slowly boiling water, while water is kept boiling.
Leave to boil and allow to simmer slowly (30 min) until dry.
Through the water away and steam the rice over boiling water for 10 min. Serves.

Stewed peaches (Original). Servers 4-6.

Ingredients		Recipe
	g	%
peaches, dried	160.0	60.4%
water	100.0	37.7%
lemon peel	5.0	1.9%
Total	265.0	100.0%

Method:
Put the ingredients in a double boiler and allow peaches to swell for 30 min while stirring occasionally. Serves.

Greek salad (Original). Serves 4-6.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
lettuce	60.0	12.1%	60.0	15.2%	
cucumber, sliced	100.0	20.2%	100.0	25.3%	
tomato, wedges	150.0	30.3%	150.0	38.0%	
yellow pepper, seeded, chopped	50.0	10.1%	50.0	12.7%	
feta cheese, squared	100.0	20.2%	0.0	0.0%	Omit for the milk-allergic child.
olives	35.0	7.1%	35.0	8.9%	
Total	495.0	100.0%	395.0	100.0%	

Method:
Wash and dry lettuce. Tear into pieces.
Cut cucumber in slices. Cut tomato in wedges and yellow pepper in strips.
Toss all the ingredients in a glass bowl. Sprinkle feta and olives on top. Serves.

Carrots Julienne (Original). Serves 4-6.

Ingredients		Recipe
	g	%
carrots	750.0	75.8%
water	200.0	20.2%
oil	30.0	3.0%
salt	5.0	0.5%
ginger	5.0	0.5%
Total	990.0	100.0%

Method:
Wash carrots and cut them in long strips.
Cook just until just tender.
Add oil, salt and ginger. Serves.

Sugar peas (Original). Serves 4.

Ingredients		Recipe
	g	%
sugar peas	500.0	73.0%
water	150.0	21.9%
oil	10.0	1.5%
sugar	15.0	2.2%
mint	10.0	1.5%
total	685.0	100.0%

Method:
Wash sugar peas. Cook in salt and water until just tender.
Add oil, sugar and mint. Serves.

Tomato and basil salad (Original). Serves 4.

Ingredients		Recipe
	g	%
tomato	500.0	79.2%
onion, sliced	100.0	15.8%
basil, chopped	15.0	2.4%
oil	8.0	1.3%
balsamic vinegar	8.0	1.3%
Total	631.0	100.0%

Method:
Sliced the tomatoes and onions in rings.
Arrange the onions on top of the tomatoes. Sprinkle with a mixture of basil, balsamic vinegar and olive oil. Serves.

Baked vegetables (Original). Serves 4.

Ingredients		Recipe
	g	%
onion	200.0	16.7%
red sweet pepper	150.0	12.5%
mushrooms	150.0	12.5%
baby marrow	200.0	16.7%
sweet corn	200.0	16.7%
cauliflower	150.0	12.5%
beans	100.0	8.3%
oil	45.0	3.8%
mixed herbs	5.0	0.4%
Total	1200.0	100.0%

Method:
Wash and prepare the vegetable.
Lightly brush with the oil.
Bake in oven at 180°C for approximately 30 min, or until done.

Sweet potatoes with ginger and lemon (Original). Serves 4-6.

Ingredients		Recipe
	g	%
sweet potatoes, chopped	500.0	76.3%
water	100.0	15.3%
salt	5.0	0.8%
ginger	10.0	1.5%
honey	30.0	4.6%
lemon rind	10.0	1.5%
Total	655.0	100.0%

Method:
Boil sweet potatoes untill soft in water with salt and ginger.
Sprinkle honey and lemon rind over. Serves.

Potato wedges (Original). Serves 4.

Ingredients		Recipe
	g	%
potatoes	500.0	57.5%
oil	350.0	40.2%
cajun salt	20.0	2.3%
Total	870.0	100.0%

Method:
Cut potatoes in wedges .
Slowly put wedges in preheated oil.
After wedges have browned, put it on paper towel, then sprinkle with cajun salt. Serves.

Baked brinjal (Lategan, 2000:99). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
brinjal	400.0	39.7%	400.0	39.7%	
oil	8.0	0.8%	8.0	0.8%	
onion, chopped	75.0	7.4%	75.0	7.4%	
garlic, chopped	5.0	0.5%	5.0	0.5%	
tomato, ripe, peeled, chopped	200.0	19.9%	200.0	19.9%	
origanum	2.0	0.2%	2.0	0.2%	
salt	3.0	0.3%	3.0	0.3%	
oil	15.0	1.5%	15.0	1.5%	
cake flour/potato flour	12.0	1.2%	12.0	1.2%	Potato flour added to replace the cake flour for wheat-allergic child.
milk/soy milk	250.0	24.8%	250.0	24.8%	Soy milk added to replace the cow's milk for the milk-allergic child.
pepper	2.0	0.2%	2.0	0.2%	
parsley, chopped	10.0	1.0%	10.0	1.0%	
breadcrumbs/oats, dried/toasted	25.0	2.5%	25.0	2.5%	Toasted oats used to replace breadcrumbs for wheat-allergic child.
Total	1007.0	100.0%	1007.0	100.0%	

Method:
Cut unpeeled brinjal into 10 mm slices. Soak in salty water for 30 min. Drain.
Swiftly fry the brinjal slices in the olive oil. Drain on a paper towel.
Stir-fry the onion and garlic until onion is translucent. Add the tomato, origanum, salt and pepper and stir to mix.
Simmer the mixture for about 15 min until the tomato is soft and cooked.
Prepare a white sauce from the oil, cake/potato flour, milk/soy milk, salt and pepper. Add the parsley.
Spoon tomato sauce into a 200 x 200 mm oven dish. Top sauce with brinjal slices. Spoon white sauce over. Sprinkle with breadcrumbs.
Bake at 180°C for 30 to 40 min. Serves.

Broccoli salad (Original). Serves 4.

Ingredients	Recipe	
	g	%
broccoli	250.0	57.2%
bacon, diced	100.0	22.9%
lettuce	40.0	9.2%
cucumber, sliced	40.0	9.2%
oil	2.0	0.5%
balsamic vinegar	5.0	1.1%
Total	437.0	100.0%

Method:
Cook brokkoli until soft. Fry bacon strips.
Arrange brokkoli on top of lettuce. Sprinkle bacon and cucumber on top.
Sprinkle olive oil and balsamic vinegar over. Serves.

Parsley loaf (Lategan, 2000: 141). 20 slices.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
bran rich self-raising flour	260.0	43.9%	260.0	52.3%	
salt	3.0	0.5%	3.0	0.6%	
mustard powder	2.0	0.3%	2.0	0.4%	
black pepper	2.0	0.3%	2.0	0.4%	
oil	45.0	7.6%	45.0	9.1%	
cheddar cheese, grated	100.0	16.9%	0.0	0.0%	Omit for cow's milk-allergic child.
parsley, chopped	30.0	5.1%	30.0	6.0%	
egg, beaten	50.0	8.4%	50.0	10.1%	Recipe not suitable for egg-allergic child.
water	100.0	16.9%	100.0	20.1%	
garlic	0	0.0%	5.0	1.0%	Functional food and gives flavour.
Total	592.0	100.0%	497.0	100.0%	

Method:
Mix dry ingredients. Add oil to the dry ingredients until the mixture resembles fresh breadcrumbs.
Add the cheese and parsley to the dry ingredients.
Mix the egg and water. Add to the dry ingredients and mix to produce a soft sticky dough. Add more water if the dough is too dry.
Shape the dough into a greased medium-sized loaf tin. Level.
Bake at 180°C for 40 to 50 min until the loaf is golden brown and done.
Serves lukewarm and fresh.

Brown rice with lentils (Original). Serves 4.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
brown rice, raw	175.0	63.6%	525.0	60.0%	Raw rice absorbs 150 g water.
lentils, raw	100.0	36.4%	350.0	40.0%	
Total	275.0	100.0%	875.0	100.0%	Raw lentils absorb 250 g water.

Method:
Bring 500 ml water to the boil.
Add the rice, lentils and salt to slowly boiling water, while water keep boiling.
Leave it to boil for 20 min.
Drain the rice and steam over boiling water for 15 min. Serves.

Carrot and pineapple salad (Original). Serves 4.

Ingredients	Recipe	
	g	%
carrots, coarsely grated	400.0	64.5%
pineapple cubed	200.0	32.3%
orange juice	20.0	3.2%
Total	620.0	100.0%

Method:
Arrange the pineapple squares on top of the grated carrots, and sprinkle the orange juice on it.

Potato mash (Original). Serves 4-6.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
potato	600.0	85.1%	600.0	85.1%	
oil	50.0	7.1%	50.0	7.1%	
milk/soy milk	50.0	7.1%	50.0	7.1%	Soy milk added to replace milk for cow's milk-allergic child.
salt	5.0	0.7%	5.0	0.7%	
Total	705.0	100.0%	705.0	100.0%	

Method:
Boil potatoes until done. Mash potatoes an add all the other ingredients. Serves.

Cucumber and tomato salad (Original). Serves 5.

Ingredients	Recipe	
	g	%
cucumber, sliced	400.0	38.6%
tomatoes, sliced	400.0	38.6%
onions, diced	200.0	19.3%
oil	15.0	1.4%
balsamic vinegar	15.0	1.4%
salt	5.0	0.5%
Total	1035.0	100.0%

Method:
Arrange the ingredients from bottom to top. First the cucumbers, then the tomatoes and the onion rings on top.
Sprinkle the oil, vinegar and salt on top.

Basmati rice (Original). Serves 4-6.

Ingredients	Recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
basmati rice, raw	250.0	98.0%	370.0	98.7%	Raw basmati rice absorbs 120 g water.
salt	5.0	2.0%	5.0	1.3%	
Total	255.0	100.0%	375.0	100.0%	

Method:
Bring 300 ml water to the boil.
Add the basmati rice and salt, slowly to boiling water, while water keep boiling.
Leave it to boil for 15-20 min.
Through the water away and steam the rice over boiling water for 30 min.

Ginger and honey carrots (Original). Serves 4-6.

Ingredients	Recipe	
	g	%
carrots, diced	500.0	82.6%
honey	80.0	13.2%
oil	20.0	3.3%
ginger	5.0	0.8%
Total	605.0	100.0%

Method:
Cook/steam carrots until done. Warm oil, add honey and ginger.
Add carrots to mixture and heat for 2 min together.
Serve hot.

Coleslaw (Reader's Digest, 1990:65). Serves 4.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
cabbage	500.0	58.6%	500.0	58.6%	
carrots, grated	75.0	8.8%	75.0	8.8%	
onion, finely sliced	100.0	11.7%	100.0	11.7%	
mayonnaise	75.0	8.8%	75.0	8.8%	Omit in the case of the children allergic to soy and egg. Add more yoghurt.
sour cream/yoghurt	80.0	9.4%	80.0	9.4%	Child allergic to milk, use more mayonnaise and dilute with 40 g orange juice.
lemon juice	20.0	2.3%	20.0	2.3%	
salt	2.0	0.2%	2.0	0.2%	
black pepper	1.0	0.1%	1.0	0.1%	
Total	853.0	100.0%	853.0	100.0%	

Method:
Cut the stalk end from the cabbage, and remove any discoloured or limp outer leaves.
Quarter the cabbage lengthways, and trim off and discard the core at the point of each quarter.
Cut the sections of cabbage into very thin slices.
Place the slices in a bowl and toss with all the other ingredients. Serves.

Steamed baby marrow (Original). Serves 4-6.

Ingredients		Recipe
	g	%
baby marrow, sliced	500.0	97.1%
water	15.0	2.9%
Total	515.0	100.0%

Method:
Steam the baby marrows in microwave for 5-7 min on high.
Serves hot.

ADDENDUM 10D: ADDITIONAL RECIPES TO TWO-WEEK MENU CYCLES.

Eggless chocolate cake (Lategan, 1997:72). 20 Slices.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
cake flour	310.0	35.9%	310.0	35.5%	Not suitable wheat-allergic child.
cocoa powder	35.0	4.1%	35.0	4.0%	
coffee powder	0.0	0.0%	10.0	1.1%	Added for stronger taste.
baking powder	8.0	0.9%	8.0	0.9%	
bicarbonate of soda	8.0	0.9%	8.0	0.9%	
salt	2.0	0.2%	2.0	0.2%	
castor sugar	275.0	31.9%	275.0	31.5%	
oil	140.0	16.2%	140.0	16.0%	
vinegar	30.0	3.5%	30.0	3.4%	
vanilla essence	5.0	0.6%	5.0	0.6%	
water	50.0	5.8%	50.0	5.7%	
Total	863.0	100.0%	873.0	100.0%	

Method:
Sift together the flour, cocoa, baking powder, bicarbonate of soda, salt and castor sugar.
Mix the oil, vinegar, essence and water. Gradually stir into dry ingredients while beating the mixture.
Pour batter into two greased, lined 230 mm diameter cake pans or one deep 230 mm cake pan.
Bake at 180°C for 35 to 40 min until cake tester comes out clean.
Allow to cool for 5 min in cake pan (s) before turning out onto a cooling rack.
Decorate as prefer.

Chocolate cup cakes (Lategan, 1997:86). 12 cup cakes.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
eggs	150.0	58.6%	150.0	58.6%	Not suitable for egg-allergic child.
sugar	50.0	19.5%	50.0	19.5%	
vanilla essence	5.0	2.0%	5.0	2.0%	
cornflour	30.0	11.7%	30.0	11.7%	
cocoa powder	20.0	7.8%	20.0	7.8%	
salt	1.0	0.4%	1.0	0.4%	
Choc-chip squares	0.0	0.0%	20.0	7.8%	Added to improve flavour and texture.
Total	256.0	100.0%	256.0	100.0%	

Method:
Beat the eggs until light and fluffy.
Gradually add the sugar while beating. Beat until the mixture is stiff. Stir in vanilla essence.
Sift together cornflour, cocoa and salt. Fold into the egg mixture.
Spoon batter into 12 paper cups.
Bake at 180°C for 12 to 15 min. Decorate with choc-chip squares while still warm, according to taste and tolerance.

Sago pudding (Lategan, 1997:120). Serves 1.

Ingredients	Original recipe		Adapted recipe		Reason for change/ingredient
	g	%	g	%	
sago	30.0	8.5%	30.0	8.4%	
water/fruit juice	300.0	85.5%	300.0	84.3%	
salt	1.0	0.3%	1.0	0.3%	
oil	10.0	2.8%	10.0	2.8%	
honey	10.0	2.8%	10.0	2.8%	
cinnamon	0.0	0.0%	5.0	1.4%	Added to improve flavour.
Total	351.0	100.0%	356.0	100.0%	

Method:
Soak sago for 1 hour in water or fruit juice. Drain sago. Keep liquid.
Heat the drained liquid, salt, oil and honey and bring to the boil.
Add soaked sago to the boiling mixture. Stir and cook over low heat until the mixture thickens and sago is transparent. Serve hot.

Vegetable tofu smoothie (Proos, 2002). Serves 5.

Ingredients	Original recipe		Original recipe		Reason for change/ingredient
	g	%	g	%	
apples, seeded, chopped	200.0	19.0%	200.0	19.0%	
beetroot, peeled, chopped	45.0	4.3%	45.0	4.3%	
carrots, peeled, chopped	150.0	14.2%	150.0	14.2%	
apricot juice	350.0	33.2%	350.0	33.2%	
spinach, chopped	100.0	9.5%	100.0	9.5%	
ascorbic acid	10.0	0.9%	10.0	0.9%	
tofu	200.0	19.0%	0.0	0.0%	
bulgarian yoghurt	0.0	0.0%	200.0	19.0%	Added for the soy-allergic child.
Total	1055.0	100.0%	1055.0	100.0%	

Method:
Add the apples, beetroot, carrots and juice in a blender and blend until relatively fine.
Add the tofu and ascorbic acid (capsule or powder) and blend until fine.
Through the juice and fibres through a strainer for a smooth texture.
Chill and serve.

ADDENDUM 11

Addendum 11: Example of recipe in *Allergy Advisor*

ALLERGY Advisor

Pancakes #1

Free-from: Wheat ◉ Gluten ◉ Egg ○ Corn ◉ Milk ◉ Soya ◉ Vegetarian

Ingredients:

Water or milk substitute (recipe included)	375 ml	1 1/2 cup
Salt	1 ml	1/4 tsp
Allowed oil	60 ml	1/4 cup
Egg		1
Fructose sugar	7 ml	1/2 Tbls
Corn-free baking powder	15 ml	1 Tbls
Rice flour	310 ml	1 1/4 cups
Amaranth or quinoa flour	60 ml	1/4 cup

Method: Mix dry ingredients. Add liquid ingredients and mix well. Cook on greased pre-heated griddle on medium heat. Allow to rise and cook slowely. Only turn once or they will flatten out.

Comments: Serving size: 1/4 recipe
Kcals: 329
Carbohydrate (g): 39.9
Fat (g): 15.4
Protein (g): 7.5

Yield: 4 Servings

Source: Dietary Management of Histamine Intolerance
Janice M. Joneja, Ph.D., RDN
Allergy Nutrition Research Program, Vancouver

ADDENDUM 12

ADDENDUM 12A: PRODUCT SCOUTING FOR HIDDEN ALLERGENS IN COMMERCIAL BREADS.

| | Hidden allergens: wheat protein*** | | |

ADDENDUM 12A: PRODUCT SCOUTING FOR HIDDEN ALLERGENS IN COMMERCIAL BREADS (continued).

		Sasko Sam White Bread	*Sasko Sam Whole-wheat*	*Sasko Sam Whole-wheat*	*Sasko Sam White Bread enriched*	*Sasko Dumpey*	*Sasko Boland Traditional Whole-wheat*	*Sasko Boland Traditional White*	*Sasko Daybreaker Brown Bread*	*Sasko Daybreaker Brown Toaster*	*Sasko Swartland Oats & Honey*	*Sasko Swartland Rye & Honey*	*Uncle Salie's Traditional*	*Uncle Salie's Home-made Whole-wheat*	*Duens Dumpey*	*Duens Brown*	*Blue Ribbon Brown*	*Blue Ribbon Toaster*	*Blue Ribbon Super*	*Duens Brown bread*	*Albany Bakeries Superior*	*Albany Bakeries Brown*	*French Connection VitaRye+-*	*French Connection Rheinische Roggenschnitten*	*French Connection Oldenburger Dark Rye*
Hidden allergens: soy protein***	Bulking agent																								
	Emulsifier	x		x					x	x					x				x		x	x			
	Hydrolysed vegetable protein (HVP)																								
	Lecithin#																								
	Miso																								
	MSG**																								
	Protein																								
	Protein extender																								
	Stabiliser																								
	Starch																								
	Textured vegetable protein																								
	Thickener																								
	Tofu																								
	Vegetable broth																								
	Vegetable gum																								

Mostly produced from soya but may be manufactored from egg.

** Sometimes produced from soya or wheat but now mostly by synthetic means.

***Source: South African Department of Health, 2002:74-75 (Edited).

ADDENDUM 12 A: PRODUCT SCOUTING FOR HIDDEN ALLERGENS IN COMMERCIAL BREADS (continued).

| | Hidden allergens: milk protein*** | | |

ADDENDUM 12A: PRODUCT SCOUTING FOR HIDDEN ALLERGENS IN COMMERCIAL BREADS (continued).

	Hidden allergens: egg protein***																	
	Albumen	Binder	Coagulant	Emulsifier	Globulin	Lecithin	Livetin	Lysozyme	Ovalbumin	Ovomucin	Ovomucoid	Ovovitellin	Vitellin					
Sasko Sam White Bread																		
Sasko Sam Whole-wheat																		
Sasko Sam Whole-wheat																		
Sasko Sam White Bread enriched																		
Sasko Dumpey																		
Sasko Boland Traditional Whole-wheat																		
Sasko Boland Traditional White																		
Sasko Daybreaker Brown Bread																		
Sasko Daybreaker Brown Toaster																		
Sasko Swartland Oats & Honey																		
Sasko Swartland Rye & Honey																		
Uncle Salie's Traditional																		
Uncle Salie's Home-made Whole-wheat																		
Duens Dumpey																		
Duens Brown																		
Blue Ribbon Brown																		
Blue Ribbon Toaster				X														
Blue Ribbon Super				X														
Duens Brown bread																		
Albany Bakeries Superior				X														
Albany Bakeries Brown				X														
French Connection VitaRye+-																		
French Connection Rheinische Roggenschnitten																		
French Connection Oldenburger Dark Rye																		

*** Source: South African Department of Health, 2002:74 (Edited).

ADDENDUM 12B: PRODUCT SCOUTING FOR HIDDEN ALLERGENS IN COMMERCIAL GARLIC LOAVES AND PIZZA BASES.

Hidden allergens: wheat protein***	*Papa's Bakery Garlic Bread*	*Griddles "roosterkoek" plain*	*Griddles "roosterkoek" herb*	*Griddles Plain Pizza*	*Mighty Meal Today Tomato Pizza Base*	*Julies Genuine Italian Pizza*	*Hal Pizza Base*
All-purpose flour	x	x	x	x	x	x	x
Bleached/unbleached flour							
Bulgur							
Bran							
Cornstarch							
Couscous							
Durum wheat/flour							
Enriched flour							
Farina							
Gelatinitised starch							
Gluten/Vital gluten							
Graham flour							
High protein flour							
Kamut							
Malt							
Miller's bran							
Modified starch							
Semolina							
Spelt							
Starch							
Vegetable gum#							
Vegetable starch#							
White flour							

May indicate the presence of soy protein or may be manufactured from cassava (tapioca), maize or rice.

Hidden allergens: soy protein***							
Bulking agent							
Emulsifier							
Guar gum							
Hydrolysed vegetable protein (HVP)							
Lecithin#							
Miso							
MSG**							
Protein							
Protein extender							
Stabiliser							
Starch							
Textured vegetable protein							
Thickener							
Tofu							
Vegetable broth							
Vegetable gum							

Mostly produced from soya but may be manufactored from egg.

** Sometimes produced from soy or wheat but now mostly by synthetic means.

*** Source: South African Department of Health, 2002:74-75 (Edited).

ADDENDUM 12B: PRODUCT SCOUTING FOR HIDDEN ALLERGENS IN COMMERCIAL GARLIC LOAVES AND PIZZA BASES (continued).

		Papa's Bakery Garlic Bread	*Griddles "roosterkoek" plain*	*Griddles "roosterkoek" herb*	*Griddles Plain Pizza*	*Mighty Meal Today Tomato Pizza Base*	*Julies Genuine Italian Pizza*	*Hal Pizza Base*
Hidden allergens: milk protein***	Artificial butter flavour		x	x				
	Butter							
	Butter fat							
	Buttermilk solids							
	Caramel colour							
	Caramel flavouring							
	Casein							
	Caseinate							
	Cheese							
	Cream curds							
	"De-lactosed" whey							
	Dry milk solids							
	High protein flavour							
	Lactalbumen							
	Lactalbumen phosphate							
	Lactose							
	Milk derivative							
	Milk solids							
	Natural flavouring							
	Rennet casein							
	Sour cream (or solids)							
	Sour milk solids							
	Whey or whey powder							
	Whey protein concentrate							
Hidden allergens: egg protein***	Albumen		x	x				
	Binder							
	Coagulant							
	Emulsifier							
	Globulin							
	Lecithin							
	Livetin							
	Lysozyme							
	Ovalbumin							
	Ovomucin							
	Ovomucoid							
	Ovovitellin							
	Vitellin							

*** Source: South African Department of Health, 2002:74 (Edited).

ADDENDUM 12C: PRODUCT SCOUTING OF COMMERCIAL BREAKFAST CEREALS FOR HIDDEN ALLERGENS.

		Bokomo Maltabella	*Bokomo Kreemy Meel*	*Bokomo Oats*	*Bokomo Pronutro Whole Wheat*	*Bokomo Pronutro Original*	*Bokomo Pronutro Chocolate*	*Bokomo Pronutro Banana*	*Bokomo Pronutro Strawberry*	*Bokomo Corn Flakes*	*Bokomo Rice Crispies*	*Kellogg's Wheat Bix*	*Kellogg's Netrifix*	*Kellogg's Rice crispies*	*Kellogg's Frosties*	*Kellogg's Chocos*	*Kellogg's Strawberry Pops*	*Kellogg's All Bran Flakes*	*Kellogg's Special K*	*Kellogg's High-fibre Bran*	*Kellogg's Corn Flakes*	*Nature's Source Choc Bitz*	*Jungle Oats*	*Tiger Oats*	*Taystee Wheat*
Hidden allergens: wheat protein***	All-purpose flour																								
	Bleached/unbleached flour																								
	Bulgur																								
	Bran																								
	Cornstarch														x										
	Couscous																								
	Durum wheat/flour																								
	Enriched flour																								
	Farina																								
	Gelatinitised starch																								
	Gluten/Vital gluten																		x						
	Graham flour																								
	High protein flour																								
	Kamut																								
	Malt									x	x				x	x	x	x	x	x	x				
	Miller's bran																								
	Modified starch																								
	Semolina																								x
	Spelt																								
	Starch																								
	Vegetable gum*																								
	Vegetable starch*	c																		o					
	White flour																								

* May indicate the presence of soy protein or may be manufactured from cassava (tapioca), maize or rice.

***Source: South Africa Department of Health, 2002:75 (Edited).

ADDENDUM 12C: PRODUCT SCOUTING OF COMMERCIAL BREAKFAST CEREALS FOR HIDDEN ALLERGENS (continued).

		Bokomo Matabella	*Bokomo Kreemy Meel*	*Bokomo Oats*	*Bokomo Pronutro Whole Wheat*	*Bokomo Pronutro Original*	*Bokomo Pronutro Chocolate*	*Bokomo Pronutro Banana*	*Bokomo Pronutro Strawberry*	*Bokomo Corn Flakes*	*Bokomo Rice Crispies*	*Bokomo Wheat Bix*	*Kellogg's Netrifix*	*Kellogg's Rice crispies*	*Kellogg's Frosties*	*Kellogg's Chocos*	*Kellogg's Strawberry Pops*	*Kellogg's All Bran Flakes*	*Kellogg's Special K*	*Kellogg's High-fibre Bran*	*Kellogg's Corn Flakes*	*Nature's Source Choc Bitz*	*Jungle Oats*	*Tiger Oats*	*Taystee Wheat*
Hidden allergens: soy protein***	Bulking agent																								
	Emulsifier																								
	Hydrolysed vegetable protein (HVP)																								
	Lecithin#																								
	Miso																								
	MSG**																								
	Protein																								
	Protein extender																								
	Stabiliser				x	x	x	x	x																
	Starch																								
	Textured vegetable protein																								
	Thickener																								
	Tofu																								
	Vegetable broth																								
	Vegetable gum																								

Mostly produced from soya but may be manufactored from egg.

** Sometimes produced from soy or wheat but now mostly by synthetic means.

***Source: South Africa Department of Health, 2002:74-75 (Edited).

ADDENDUM 12C: PRODUCT SCOUTING OF COMMERCIAL BREAKFAST CEREALS FOR HIDDEN ALLERGENS (continued).

		Bokomo Matabella	*Bokomo Kreemy Meel*	*Bokomo Oats*	*Bokomo Pronutro Whole Wheat*	*Bokomo Pronutro Original*	*Bokomo Pronutro Chocolate*	*Bokomo Pronutro Banana*	*Bokomo Pronutro Strawberry*	*Bokomo Corn Flakes*	*Bokomo Rice Crispies*	*Bokomo Wheat Bix*	*Kellogg's Netrifix*	*Kellogg's Rice crispies*	*Kellogg's Frosties*	*Kellogg's Chocos*	*Kellogg's Strawberry Pops*	*Kellogg's All Bran Flakes*	*Kellogg's Special K*	*Kellogg's High-fibre Bran*	*Kellogg's Corn Flakes*	*Nature's Source Choc Bitz*	*Jungle Oats*	*Tiger Oats*	*Taystee Wheat*
Hidden allergens: milk protein***	Artificial butter flavour																								
	Butter																								
	Butter fat																								
	Buttermilk solids																								
	Caramel colour																								
	Caramel flavouring																								
	Casein																								
	Caseinate																								
	Cheese																								
	Cream curds																								
	"De-lactosed" whey																								
	Dry milk solids																								
	High protein flavour																								
	Lactalbumen																								
	Lactalbumen phosphate																								
	Lactose																								
	Milk derivative																					x			
	Milk solids				x	x	x	x	x													x			
	Natural flavouring																								
	Rennet casein																								
	Sour cream (or solids)																								
	Sour milk solids																					x			
	Whey or whey powder																		x			x			
	Whey protein concentrate																								

***Source: South Africa Department of Health, 2002:74 (Edited).

ADDENDUM 12C: PRODUCT SCOUTING OF COMMERCIAL BREAKFAST CEREALS FOR HIDDEN ALLERGENS (continued).

		Bokomo Matabella	*Bokomo Kreemy Meel*	*Bokomo Oats*	*Bokomo Pronutro Whole Wheat*	*Bokomo Pronutro Original*	*Bokomo Pronutro Chocolate*	*Bokomo Pronutro Banana*	*Bokomo Pronutro Strawberry*	*Bokomo Corn Flakes*	*Bokomo Rice Crispies*	*Bokomo Wheat Bix*	*Kellogg's Netrifix*	*Kellogg's Rice crispies*	*Kellogg's Frosties*	*Kellogg's Chocos*	*Kellogg's Strawberry Pops*	*Kellogg's All Bran Flakes*	*Kellogg's Special K*	*Kellogg's High-fibre Bran*	*Kellogg's Corn Flakes*	*Nature's Source Choc Bitz*	*Jungle Oats*	*Tiger Oats*	*Taystee Wheat*
Hidden allergens: egg protein***	Albumen																								
	Binder																								
	Coagulant																								
	Emulsifier																								
	Globulin																								
	Lecithin																								
	Livetin																								
	Lysozyme																								
	Ovalbumin																								
	Ovomucin																								
	Ovomucoid																								
	Ovovitellin																								
	Vitellin																								

***Source: South Africa Department of Health, 2002:74 (Edited).

| | Hidden allergens: wheat protein*** | | |

ADDENDUM 12D: PRODUCT SCOUTING OF COMMERCIAL PASTA PRODUCTS FOR HIDDEN ALLERGENS (continued).

		Fatti's & Moni's Shells	*Fatti's & Moni's Macaroni*	*Fatti's & Moni's Gnocci*	*Fatti's & Moni's Fusilli*	*Fatti's & Moni's Fusilli Tricolone*	*Fatti's & Moni's Lasagne*	*Fatti's & Moni's Mix Screws*	*Mr Pasta Macaroni*	*Mr Pasta Screws*	*Mr Pasta Spaghetti*	*Monteverde Shells*	*Monteverde Farfalla*	*Monteverde Fusilli*	*Monteverde Linguine*	*Monteverde Spaghetti*	*Monteverde Macaroni*	*Barilla Lasagne*	*The Original Pasta Regalo Gluten-free Spaghetti*	*The Original Pasta Regalo Gluten-free Butternut*	*The Original Pasta Regalo Gluten-free Lasagne*	*The Original Pasta Regalo Gluten-free Fettuccine*	*The Original Pasta Regalo Wheat-free Chilli*	*The Original Pasta Regalo Wheat-free Mushroom*	*The Original Pasta Regalo Wheat-free Shells*	*The Original Pasta Regalo Wheat-free Tagliatelle*	*The Original Pasta Regalo Wheat-free Beetroot*
Hidden allergens: soy protein***	Bulking agent																										
	Emulsifier																										
	Hydrolysed vegetable protein (HVP)																										
	Lecithin#																										
	Miso																										
	MSG**																										
	Protein																										
	Protein extender																										
	Stabiliser																										
	Textured vegetable protein																										
	Thickener																										
	Tofu																										
	Vegetable broth																										
	Vegetable gum																										

Mostly produced from soya but may be manufactored from egg.

** Sometimes produced from soya or wheat but now mostly by synthetic means.

Hidden allergens: milk protein***	Artificial butter flavour																										
	Butter																										
	Butter fat																										
	Buttermilk solids																										
	Caramel colour																										
	Caramel flavouring																										
	Casein																										
	Caseinate																										
	Cheese																										
	Cream curds																										
	"De-lactosed" whey																										
	Dry milk solids																										
	High protein flavour																										
	Lactalbumen																										
	Lactalbumen phosphate																										
	Lactose																										
	Milk derivative																										
	Milk solids																										
	Natural flavouring																										
	Rennet casein																										
	Sour cream (or solids)																										
	Sour milk solids																										
	Whey or whey powder																										
	Whey protein concentrate																										

***Source: South Africa Department of Health, 2002:75 (Edited).

Hidden allergens: egg protein***																			
Vitellin	Ovovitellin	Ovomucoid	Ovomucin	Ovalbumin	Lysozyme	Livetin	Lecithin	Globulin	Emulsifier	Coagulant	Binder	Albumen							
													Fatti's & Moni's Shells						
													Fatti's & Moni's Macaroni						
													Fatti's & Moni's Gnocci						
													Fatti's & Moni's Fusilli						
													Fatti's & Moni's Fusilli Tricolone						
													Fatti's & Moni's Lasagne						
													Fatti's & Moni's Mix Screws						
													Mr Pasta Macaroni						
													Mr Pasta Screws						
													Mr Pasta Spaghetti						
													Monteverde Shells						
													Monteverde Fartalla						
													Monteverde Fusilli						
													Monteverde Linguine						
													Monteverde Spaghetti						
													Monteverde Macaroni						
													Barilla Lasagne						
													The Original Pasta Regalo Gluten-free Spaghetti						
													The Original Pasta Regalo Gluten-free Butternut						
													The Original Pasta Regalo Gluten-free Lasagne						
													The Original Pasta Regalo Gluten-free Fettuccine						
													The Original Pasta Regalo Wheat-free Chilli						
													The Original Pasta Regalo Wheat-free Mushroom						
													The Original Pasta Regalo Wheat-free Shells						
													The Original Pasta Regalo Wheat-free Tagliatelle						
													The Original Pasta Regalo Wheat-free Beetroot						

***Source: South Africa Department of Health, 2002:74 (Edited).

ADDENDUM 13E: PRODUCT SCOUTING OF MAYONNAISE AND TOMATO SAUCE FOR HIDDEN ALLERGENS.

Hidden allergens, indicating presence of wheat protein	Koo mayonnaise	Nola mayonnaise	Kraft Mayonnaise	Cross & Blackwell Mayonnaise	Hellman's Real Mayonnaise	Hellman's Lite Mayonnaise	Heinz Tomato Ketchup	All Gold Tomato Sauce	All Gold Hot and Spicy	Wellington's Tomato Sauce	Master Foods	Safari Tomato Sauce
All-purpose flour												
Bleached/unbleached flour												
Bulgar												
Bran												
Cornstarch												
Couscous												
Durum wheat/flour												
Enriched flour												
Farina												
Gelatinitised starch												
Gluten/Vital gluten												
Graham flour												
High protein flour												
Kamut												
Malt												
Miller's bran												
Modified starch												
Semolina												
Spelt												
Starch												
Vegetable gum*												
Vegetable starch*												
White flour												

* May indicate the presence of soy protein or may be manufactured from cassava (tapioca), maize or rice.

Hidden allergens, indicating presence of soy pr												
Bulking agent												
Emulsifier												
Hydrolysed vegetable protein (HVP)												
Lecithin*#												
Miso												
MSG**												
Proetin												
Protein extender												
Stabiliser	x			x								
Starch												
Textured vegetable protein												
Thickener		x	x	x	x	x						
Tofu												
Vegetable broth												
Vegetable gum												

Mostly produced from soya but may be manufactored from egg.

** Sometimes produced from soya or wheat but now mostly be synthetic means.

ADDENDUM 13E: PRODUCT SCOUTING OF MAYONNAISE AND TOMATO SAUCE FOR HIDDEN ALLERGENS (continued).

		Koo mayonnaise	Nola mayonnaise	Kraft Mayonnaise	Cross & Blackwell Mayonnaise	Hellman's Real Mayonnaise	Hellman's Lite Mayonnaise	Heinz Tomato Ketchup	All Gold Tomato Sauce	All Gold Hot and Spicy	Wellington's Tomato Sauce	Master Foods	Safari Tomato Sauce
Hidden allergens, indicating presence of milk protein	Artificial butter flavour												
	Butter												
	Butter fat												
	Buttermilk solids												
	Caramel colour												
	Caramel flavouring												
	Casein												
	Caseinate												
	Cheese												
	Cream curds												
	"De-lactosed" whey												
	Dry milk solids												
	High protein flavour												
	Lactalbumin												
	Lactalbumin phosphate												
	Lactose												
	Milk derivate												
	Milk solids												
	Natural flavouring												
	Rennet casein												
	Sour cream (or solids)												
	Sour milk solids												
	Whey or whey powder												
	Whey protein concentrate												
Hidden allergens, indicating presence of egg protein	Egg Protein	x	x	x	x	x	x						
	Albumin												
	Binder												
	Coagulant												
	Emulsifier												
	Globulin												
	Lecithin												
	Livetin												
	Lysozyme												
	Ovalbumin												
	Ovamucin												
	Ovamucoid												
	Ovovitellin												
	Vitellin												

ADDENDUM 12F: PRODUCT SCOUTING FOR MARMITE AND YOGHURT FOR HIDDEN ALLERGENS.

Hidden allergens: wheat protein***	*Marmite*	*Clover Yoghurt*	*Gero Yoghurt*	*Darling Yoghurt*	*Parmalat Yoghurt*	*Dairy Bell Yoghurt*
All-purpose flour						
Bleached/unbleached flour						
Bulgur						
Bran						
Cornstarch						
Couscous						
Durum wheat/flour						
Enriched flour						
Farina						
Gelatinitised starch						
Gluten/Vital gluten						
Graham flour						
High protein flour						
Kamut						
Malt						
Miller's bran						
Modified starch						
Semolina						
Spelt						
Starch						
Vegetable gum*						
Vegetable starch*						
White flour						

* May indicate the presence of soy protein or may be manufactured from cassava (tapioca), maize or rice.

Hidden allergens: soy protein***						
Bulking agent						
Emulsifier						
Hydrolysed vegetable protein (HVP)						
Lecithin#						
Miso						
MSG**						
Proetin						
Protein extender						
Stabiliser		x	x	x	x	x
Starch						
Textured vegetable protein						
Thickener						
Tofu						
Vegetable broth						
Vegetable gum						

\# Mostly produced from soy but may be manufactored from egg.

** Sometimes produced from soya or wheat but now mostly by synthetic means.

***Source: South Africa Department of Health, 2002:74-75 (Edited).

ADDENDUM 12F: PRODUCT SCOUTING FOR MARMITE AND YOGHURT FOR HIDDEN ALLERGENS.

		Marmite	*Clover Yoghurt*	*Gero Yoghurt*	*Darling Yoghurt*	*Parmalat Yoghurt*	*Dairy Bell Yoghurt*
Hidden allergens: milk protein***	Artificial butter flavour						
	Butter						
	Butter fat						
	Buttermilk solids						
	Caramel colour						
	Caramel flavouring						
	Casein						
	Caseinate						
	Cheese						
	Cream curds						
	"De-lactosed" whey						
	Dry milk solids		x	x	x	x	x
	High protein flavour						
	Lactalbumen						
	Lactalbumen phosphate						
	Lactose						
	Milk derivative						
	Milk solids						
	Natural flavouring						
	Rennet casein						
	Sour cream (or solids)						
	Sour milk solids						
	Whey or whey powder						
	Whey protein concentrate						
Hidden allergens: egg protein***	Egg Protein						
	Albumen						
	Binder						
	Coagulant						
	Emulsifier						
	Globulin						
	Lecithin						
	Livetin						
	Lysozyme						
	Ovalbumin						
	Ovomucin						
	Ovomucoid						
	Ovovitellin						
	Vitellin						

***Source: South Africa Department of Health, 2002:74 (Edited).

ADDENDUM 13

Individual Meal Analysis for : suzette 5

Name	: suzette 5
ID Number	: 5
Code	: 5
Gender	: c
Age	: 10 year(s) 3 month(s)

RDA used for Analysis

Standard RDA

Meal Constituents

Daily on 01/01/2001 :
- 250.0 gram of Fruit salad [250.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 150.0 gram of Ekstra breakfast 1 [150.0g]
- 220.0 gram of "melkkos" [220.0g]
- 325.0 gram of Lemon and rosemary chicken [325.0g]
- 50.0 gram of Tagliatelle pasta & olive oil [50.0g]
- 75.0 gram of Mixed vegetables [75.0g]
- 35.0 gram of Green salad [35.0g]

Daily on 02/01/2001 :
- 100.0 gram of Orange Juice, Fresh [100.0g]
- 80.0 gram of Apple, Granny Smith, Raw [80.0g]
- 80.0 gram of Wholewheat bread [80.0g]
- 100.0 gram of Breakfast 2 [100.0g]
- 315.0 gram of warm spiced chickpea dish [315.0g]
- 250.0 gram of Bobotie (s) [250.0g]
- 40.0 gram of Stewed peaches (s) [40.0g]
- 30.0 gram of Brown rice [30.0g]
- 30.0 gram of Greek salad [30.0g]

Daily on 03/01/2001 :
- 80.0 little/small/thin 53MMX50MM DIAM of Peach, Raw [6400.0g]
- 100.0 gram of Grape, Sultana, Raw [100.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 45.0 gram of Green salad [45.0g]
- 250.0 gram of Breakfast 3 (s) [250.0g]
- 250.0 gram of Mushroom, cheese and garlic potato (s) [250.0g]
- 195.0 gram of Grille chicken kebabs (s) [195.0g]
- 30.0 gram of Carrots juillene (s) [30.0g]

Daily on 04/01/2001 :
- 200.0 plenty/large/thick 100MMX70MM DIAM of Pear, Raw [44000.0g]
- 50.0 gram of Greek salad [50.0g]
- 150.0 gram of Breakfasrt4 (s) [150.0g]
- 210.0 gram of Spinach and mango salad (s) [210.0g]
- 600.0 gram of Vegetarian lasange (s) [600.0g]

Daily on 05/01/2001 :
- 80.0 gram of Yoghurt, Soy [80.0g]
- 50.0 gram of Pineapple, Raw (peeled) [50.0g]
- 250.0 gram of Fruit salad [250.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 280.0 gram of Gren bean and onion dish [280.0g]
- 144.0 gram of s [144.0g]

Daily on 06/01/2001 :
- 100.0 gram of Egg, Chicken, Whole, Boiled / Poached [100.0g]
- 200.0 plenty/large/thick 135MMX75MM DIAM (480G WITH PEEL AND PIP) of Mango, Raw (peeled) [70000.0g]
- 20.0 gram of Tomato, Raw [20.0g]
- 40.0 gram of Wholewheat bread [40.0g]

125.0 gram of Couscous ratatoille salad [125.0g]
325.0 gram of Kabeljou & sour cream [325.0g]
600.0 gram of aand 6 [600.0g]
Daily on 07/01/2001 :
80.0 gram of Nectarine, Raw [80.0g]
40.0 gram of Wholewheat bread [40.0g]
60.0 gram of Green salad [60.0g]
200.0 gram of bANANA MUFFIN (S) [200.0g]
230.0 gram of Butternut soup [230.0g]
125.0 gram of Sesame seed chicken [125.0g]
60.0 gram of Sweet potatoes (s) [60.0g]
100.0 gram of grilled vegetables [100.0g]

Macronutrients

Description	Amount	RDA	(=)	RDA %	(+)	
Moisture [g]	14968.8					
Energy [kJ]	56557	8368.0		675.87%		
Nitrogen [g]	20.25					
Total protein [g]	140.8	28.0		502.73%		
Plant protein [g]	105.2					
Animal protein [g]	35.2					
Total fat [g]	85.5					
Carbohydrate, avail. [g]	2623.6					
Starch [g]	51.3					
Glucose [g]	233.7					
Fructose [g]	822.5					
Galactose [g]	0.1					
Sucrose [g]	1279.4					
Maltose [g]	0.1					
Lactose [g]	0.4					
Total sugars [g]	2524.9					
Added sugar [g]	5.6					
Total dietary fibre [g]	375.9					
Insoluble dietary fibre [g]	211.9					*
Soluble dietary fibre [g]	156.7					*
Ash [g]	64.5					
Non-starch polysaccharides [g]	346.9					
Insoluble NSP [g]	190.2					*
Soluble NSP [g]	156.7					*
Lignin [g]	21.8					*

Minerals

Description	Amount	RDA	(=)	RDA %	(+)	
Ca [mg]	1446	800.0		180.75%		
Fe [mg]	58.2	10.0		582.28%		
Haem iron [mg]	0.4					*
Non-haem iron [mg]	53.2					*
Mg [mg]	1531	170.0		900.87%		
P [mg]	2615	800.0		326.83%		
K [mg]	25756					
Na [mg]	1892					
Cl [mg]	1670					
Zn [mg]	22.79	10.0		227.92%		
Cu [mg]	15.41	1.5		1027.05%		#
Cr [µg]	202.6	125.0		162.09%		#
Se [µg]	124.2	30.0		413.86%		
Mn [µg]	23042	2500.0		921.67%		#

I [µg]	383	120.0	318.80%	*
B [µg]	84933			*
F [µg]	1094			*
Si [µg]	20471			*

Vitamins

Description	Amount	RDA	(=) RDA %	(+)
Vitamin A (RE) [µg]	7653	700.0	1093.31%	
Retinol [µg]	38			
Total carotenoids [µg]	45349			
B-Carotene [µg]	44021			*
A-Carotene [µg]	940			*
Cryptoxanthin [µg]	1552			*
Thiamin [mg]	8.65	1.0	865.13%	
Riboflavin [mg]	4.86	1.2	405.20%	
Niacin [mg]	111.2	13.0	855.56%	
Vitamin B6 [mg]	9.242	1.4	660.12%	
Folate [µg]	4293	100.0	4293.39%	
Vitamin B12 [µg]	3.3	1.4	237.24%	
Pantothenate [mg]	37.62	4.5	836.05%	#
Biotin [µg]	432.6	30.0	1441.85%	#
Vitamin C [mg]	3593	45.0	7985.22%	
Vitamin D [µg]	3.84	10.0	38.41%	
Vitamin E [mg]	135.16	7.0	1930.81%	
A-Tocopherol [mg]	126.64			*
B-Tocopherol [mg]	0.66			*
D-Tocopherol [mg]	0.11			*
G-Tocopherol [mg]	0.59			*
A-Tocotrienol [mg]	0.08			*
B-Tocotrienol [mg]	0.15			*
D-Tocotrienol [mg]	0.00			*
G-Tocotrienol [mg]	0.06			*
Lycopene [µg]	1338			*
Lutein [µg]	8156			*
Vitamin K [µg]	179.20	30.0	597.33%	*

Fatty acids & cholesterol

Description	Amount	RDA	(=) RDA %	(+)
Saturated FA [g]	17.02			
Mono-unsaturated FA [g]	28.35			
Polyunsaturated FA [g]	27.91			
Single trans FA [g]	0.00			*
Double trans FA [g]	0.00			*
Total trans FA [g]	0.21			*
Cholesterol [mg]	250			
C4:0 [g]	0.00			
C6:0 [g]	0.00			
C8:0 [g]	0.01			
C10:0 [g]	0.02			
C12:0 [g]	0.04			
C13:0 [g]	0.00			*
C14:0 [g]	1.32			
C15:0 [g]	0.01			*
C16:0 [g]	11.11			
C17:0 [g]	0.02			*
C18:0 [g]	3.41			
C20:0 [g]	0.08			

Tartaric acid [mg]	10141		*
Oxalic acid [mg]	525		*
Caffeine [mg]	0		*
Tannins [mg]	0		*

Energy Calculations		Prudent Guideline	
%Energy-Protein	4.23%	+/- 15%E	
%Energy-Fat	5.59%	< 30%E	
%Energy-Saturated SFA	1.11%	< 10%E	
%Energy-Mono-unsaturated MUFA	1.85%	+ 10%E	
%Energy-Polyunsaturated PUFA	1.83%	~ 10%E	
%Energy-Carbohydrate	90.16%	+/- 55%E	
%Energy-Alcohol	0.00%		

Legend
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* - There are many missing or no values for these Nutrients.
Please consult the FoodFinder2 Manual -> Reports/Analysis: Meal Analysis.
\# - Estimated safe and adequate daily dietary intake
(value is the mean of the range)
= - RDA = Recommended Dietary Allowance
\+ - RDA % = Percentage of the Recommended Dietary Allowance

Individual Meal Analysis for : suzette 5

Name	: suzette 5
ID Number	: 5
Code	: 5
Gender	: c
Age	: 10 year(s) 3 month(s)

RDA used for Analysis

Standard RDA

Meal Constituents

Daily on 08/01/2001 :
- 40.0 gram of Wholewheat bread [40.0g]
- 100.0 gram of Breakfast 8 [100.0g]
- 250.0 gram of pasta salad (s) [250.0g]
- 100.0 gram of Roast rack of lamb (s) [100.0g]
- 600.0 gram of Aand 8 [600.0g]

Daily on 09/01/2001 :
- 80.0 gram of Apple, Starking, Raw [80.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 30.0 gram of Green salad [30.0g]
- 150.0 gram of breakfast 9(s) [150.0g]
- 230.0 gram of Asparagus dish [230.0g]
- 230.0 gram of Spaghetti bolognaise (S) [230.0g]
- 40.0 gram of Parsely loaf (s) [40.0g]

Daily on 10/01/2001 :
- 150.0 gram of Milk, Soy [150.0g]
- 90.0 gram of Breakfast Cereal- Pronutro Wholewheat [90.0g]
- 50.0 gram of Plum, Raw [50.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 250.0 gram of Canneloni (s) [250.0g]
- 400.0 gram of Aand 10(s) [400.0g]
- 220.0 gram of lentils and brown rice [220.0g]

Daily on 11/01/2001 :
- 80.0 gram of Wholewheat bread [80.0g]
- 150.0 gram of meusli & yoghurt [150.0g]
- 250.0 gram of Broccoli soup [250.0g]
- 500.0 gram of Aand 11 (s) [500.0g]

Daily on 12/01/2001 :
- 80.0 gram of Apple, Starking, Raw [80.0g]
- 25.0 gram of Wholewheat bread [25.0g]
- 300.0 gram of ontbyt 12 (s) [300.0g]
- 260.0 gram of pancakes [260.0g]
- 600.0 gram of Aand 12 (s) [600.0g]

Daily on 13/01/2001 :
- 100.0 gram of Guava, Raw (peeled) [100.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 50.0 gram of Green salad [50.0g]
- 200.0 gram of Ontbyt 13(s) [200.0g]
- 230.0 gram of spinach quiche (s) [230.0g]
- 450.0 gram of aand 13 (s) [450.0g]

Daily on 14/01/2001 :
- 80.0 gram of Milk, Soy [80.0g]
- 85.0 gram of Breakfast Cereal- Special K [85.0g]
- 120.0 gram of Fruit salad [120.0g]
- 40.0 gram of Wholewheat bread [40.0g]
- 80.0 gram of Green salad [80.0g]
- 250.0 gram of middag 14 [250.0g]

250.0 gram of Bacon, mushroom pasta [250.0g]

Macronutrients

Description	Amount	RDA	(=)	RDA %	(+)	
Moisture [g]	743.5					
Energy [kJ]	6043	8368.0		72.22%		
Nitrogen [g]	8.43					
Total protein [g]	73.2	28.0		261.44%		
Plant protein [g]	26.9					
Animal protein [g]	43.6					
Total fat [g]	56.0					
Carbohydrate, avail. [g]	137.9					
Starch [g]	27.6					
Glucose [g]	7.6					
Fructose [g]	8.9					
Galactose [g]	0.1					
Sucrose [g]	8.5					
Maltose [g]	0.3					
Lactose [g]	0.3					
Total sugars [g]	27.1					
Added sugar [g]	8.0					
Total dietary fibre [g]	22.2					
Insoluble dietary fibre [g]	6.0					*
Soluble dietary fibre [g]	4.0					*
Ash [g]	9.9					
Non-starch polysaccharides [g]	9.0					
Insoluble NSP [g]	5.1					*
Soluble NSP [g]	4.0					*
Lignin [g]	0.9					*

Minerals

Description	Amount	RDA	(=)	RDA %	(+)	
Ca [mg]	341	800.0		42.66%		
Fe [mg]	13.1	10.0		131.26%		
Haem iron [mg]	0.8					*
Non-haem iron [mg]	6.0					*
Mg [mg]	269	170.0		158.39%		
P [mg]	1003	800.0		125.36%		
K [mg]	2037					
Na [mg]	2048					
Cl [mg]	1313					
Zn [mg]	10.20	10.0		102.01%		
Cu [mg]	1.41	1.5		94.24%		#
Cr [µg]	52.7	125.0		42.13%		#
Se [µg]	57.7	30.0		192.22%		
Mn [µg]	3116	2500.0		124.64%		#
I [µg]	95	120.0		79.29%		*
B [µg]	2338					*
F [µg]	148					*
Si [µg]	1246					*

Vitamins

Description	Amount	RDA	(=)	RDA %	(+)	
Vitamin A (RE) [µg]	1140	700.0		162.85%		
Retinol [µg]	52					

%Energy-Mono-unsaturated MUFA	10.57%	+ 10%E	
%Energy-Polyunsaturated PUFA	12.35%	~ 10%E	
%Energy-Carbohydrate	45.04%	+/- 55%E	
%Energy-Alcohol	0.06%		

Legend
---

* - There are many missing or no values for these Nutrients.
Please consult the FoodFinder2 Manual -> Reports/Analysis: Meal Analysis.

\# - Estimated safe and adequate daily dietary intake
(value is the mean of the range)

= - RDA = Recommended Dietary Allowance

\+ - RDA % = Percentage of the Recommended Dietary Allowance

ADDENDUM14: WEEKLY ANALYSIS BY FOODFINDER TM 2

Macronutrients

Description	Amount	RDA	(=)	RDA %	(+)	
Moisture [g]	7856.2					
Energy [kJ]	31300	8368.0		374.05%		
Nitrogen [g]	14.34					
Total protein [g]	107.0	28.0		382.09%		
Plant protein [g]	66.0					
Animal protein [g]	39.4					
Total fat [g]	70.8					
Carbohydrate, avail. [g]	1380.8					
Starch [g]	39.4					
Glucose [g]	120.6					
Fructose [g]	415.7					
Galactose [g]	0.1					
Sucrose [g]	643.9					
Maltose [g]	0.2					
Lactose [g]	0.4					
Total sugars [g]	1276.0					
Added sugar [g]	6.8					
Total dietary fibre [g]	199.0					
Insoluble dietary fibre [g]	108.9					*
Soluble dietary fibre [g]	80.4					*
Ash [g]	37.2					
Non-starch polysaccharides [g]	178.0					
Insoluble NSP [g]	97.6					*
Soluble NSP [g]	80.4					*
Lignin [g]	11.3					*

Minerals

Description	Amount	RDA	(=)	RDA %	(+)	
Ca [mg]	894	800.0		111.71%		
Fe [mg]	35.7	10.0		356.77%		
Haem iron [mg]	0.6					*
Non-haem iron [mg]	29.6					*
Mg [mg]	900	170.0		529.63%		
P [mg]	1809	800.0		226.10%		
K [mg]	13897					
Na [mg]	1970					
Cl [mg]	1491					
Zn [mg]	16.50	10.0		164.97%		
Cu [mg]	8.41	1.5		560.65%		#
Cr [µg]	127.6	125.0		102.11%		#
Se [µg]	90.9	30.0		303.04%		
Mn [µg]	13079	2500.0		523.16%		#
I [µg]	239	120.0		199.04%		*
B [µg]	43635					*
F [µg]	621					*
Si [µg]	10859					*

Vitamins

Description	Amount	RDA	(=)	RDA %	(+)	
Vitamin A (RE) [µg]	4397	700.0		628.08%		
Retinol [µg]	45					

Total carotenoids [µg]	24946			
B-Carotene [µg]	23948			*
A-Carotene [µg]	1023			*
Cryptoxanthin [µg]	837			*
Thiamin [mg]	5.08	1.0	507.54%	
Riboflavin [mg]	3.11	1.2	258.89%	
Niacin [mg]	66.7	13.0	512.78%	
Vitamin B6 [mg]	5.444	1.4	388.86%	
Folate [µg]	2272	100.0	2272.35%	
Vitamin B12 [µg]	3.0	1.4	213.39%	
Pantothenate [mg]	22.34	4.5	496.36%	#
Biotin [µg]	233.9	30.0	779.80%	#
Vitamin C [mg]	1872	45.0	4160.45%	
Vitamin D [µg]	3.46	10.0	34.58%	
Vitamin E [mg]	76.01	7.0	1085.84%	
A-Tocopherol [mg]	69.39			*
B-Tocopherol [mg]	0.56			*
D-Tocopherol [mg]	0.09			*
G-Tocopherol [mg]	0.52			*
A-Tocotrienol [mg]	0.10			*
B-Tocotrienol [mg]	0.10			*
D-Tocotrienol [mg]	0.00			*
G-Tocotrienol [mg]	0.06			*
Lycopene [µg]	1273			*
Lutein [µg]	5277			*
Vitamin K [µg]	182.00	30.0	606.66%	*

Fatty acids & cholesterol

Description	Amount	RDA	(=)	RDA %	(+)
Saturated FA [g]	15.08				
Mono-unsaturated FA [g]	22.81				
Polyunsaturated FA [g]	24.04				
Single trans FA [g]	0.00				*
Double trans FA [g]	0.00				*
Total trans FA [g]	0.28				*
Cholesterol [mg]	241				
C4:0 [g]	0.04				
C6:0 [g]	0.02				
C8:0 [g]	0.04				
C10:0 [g]	0.10				
C12:0 [g]	0.17				
C13:0 [g]	0.00				*
C14:0 [g]	0.97				
C15:0 [g]	0.01				*
C16:0 [g]	9.26				
C17:0 [g]	0.02				*
C18:0 [g]	3.74				
C20:0 [g]	0.08				
C21:0 [g]	0.00				*
C22:0 [g]	0.18				
C23:0 [g]	0.00				*
C24:0 [g]	0.06				
C10:1 [g]	0.00				*
C12:1 [g]	0.00				*
C14:1 [g]	0.02				
C15:1 [g]	0.00				*
C16:1 [g]	2.86				
C17:1 [g]	0.01				*
C18:1 [g]	20.24				

%Energy-Mono-unsaturated MUFA	2.70%	+ 10%E	
%Energy-Polyunsaturated PUFA	2.84%	~ 10%E	
%Energy-Carbohydrate	85.80%	+/- 55%E	
%Energy-Alcohol	0.01%		

Legend
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* - There are many missing or no values for these Nutrients.
Please consult the FoodFinder2 Manual -> Reports/Analysis: Meal Analysis.
\# - Estimated safe and adequate daily dietary intake
(value is the mean of the range)
= - RDA = Recommended Dietary Allowance
\+ - RDA % = Percentage of the Recommended Dietary Allowance